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# NASA ASTRONAUTS

# NASA ASTRONAUTS

The National Aeronautics and Space Administration's space flight team is based at Manned Spacecraft Center in Houston, Texas. Since the inception of the manned space flight program 66 astronauts have been selected. Of this number 55 are still participating in the program on a full-time basis.\* The seven original astronauts were named in April 1959. Additional astronauts and scientist-astronauts have been added from time to time.

*\* John Glenn is a special consultant to the NASA Administrator. Dr. Duane E. Graveline and Scott Carpenter have resigned. Eight are deceased.*

WASHINGTON, D.C. — OCTOBER 1967

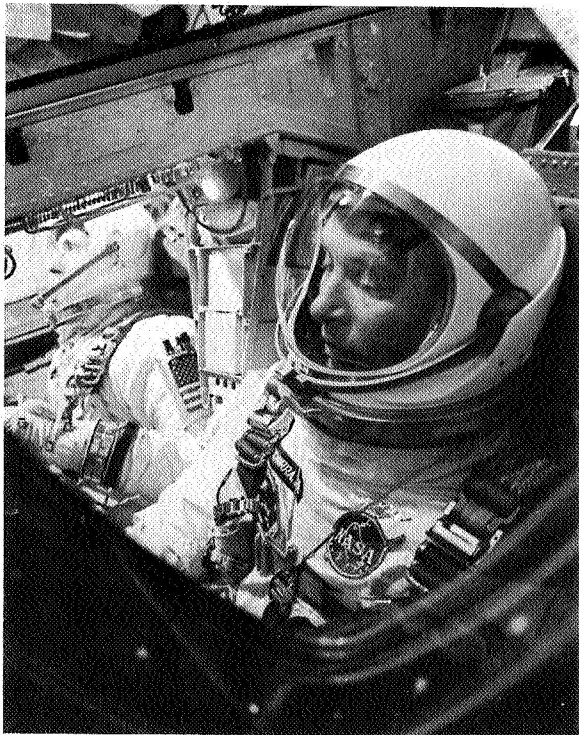
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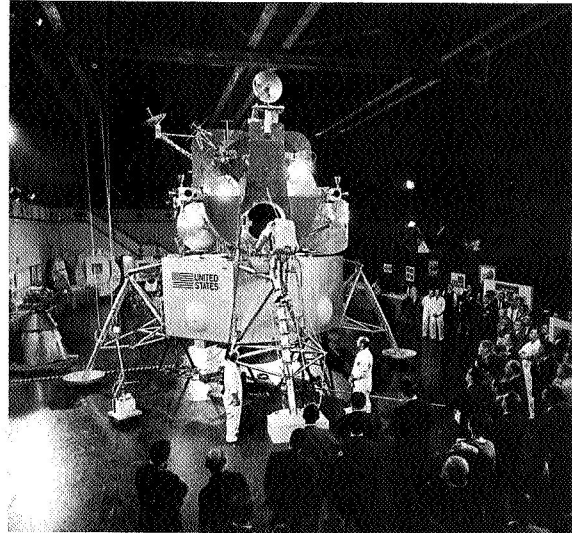


A

**A**fter Project Mercury the astronaut team devoted full time to the Gemini Program, and to preparations for manned space flight to the moon in the Apollo Program.

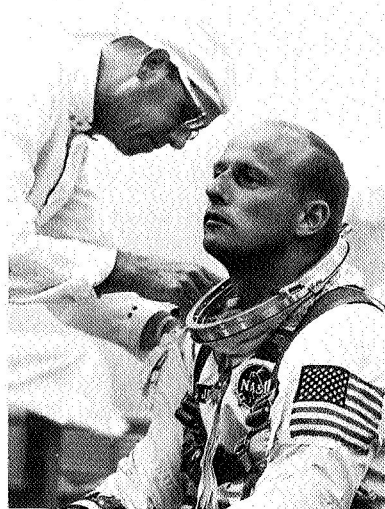
The Gemini Program provided scientists and engineers with much information required for the eventual success of a lunar landing mission. Gemini crewmen: proved that man can exist in a weightless environment for at least 14 days (twice the number of days required for a lunar landing mission); developed the techniques of rendezvous and docking, so vital to the Apollo Program; and proved it is feasible to place one space vehicle into orbit and utilize it later to furnish propellant power for docked vehicles.

The Gemini crewmen also proved that extravehicular activity for relatively long periods of time is feasible and that man is capable of performing certain duties while outside the spacecraft.



B

C



A. Astronauts prepare for space flight.

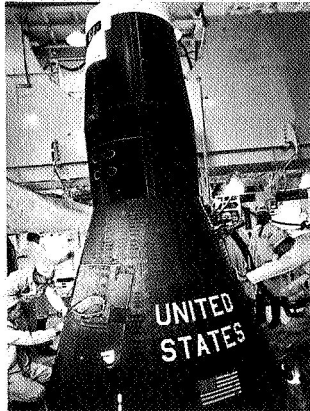
B. Demonstration of embarking method from full scale Lunar Module mock-up.

C. Gemini space suit preflight checkout.

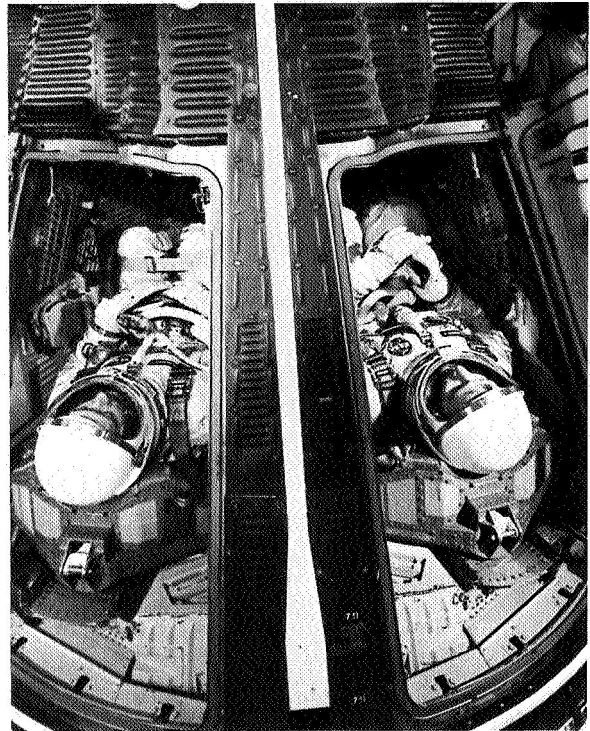
**D. Engineers seal astronauts in their Gemini spacecraft prior to flight.**

**E. Astronauts in Gemini spacecraft preparing for simulated launch.**

**F. Astronauts use celestial globe to study locations of star constellations.**



**D**



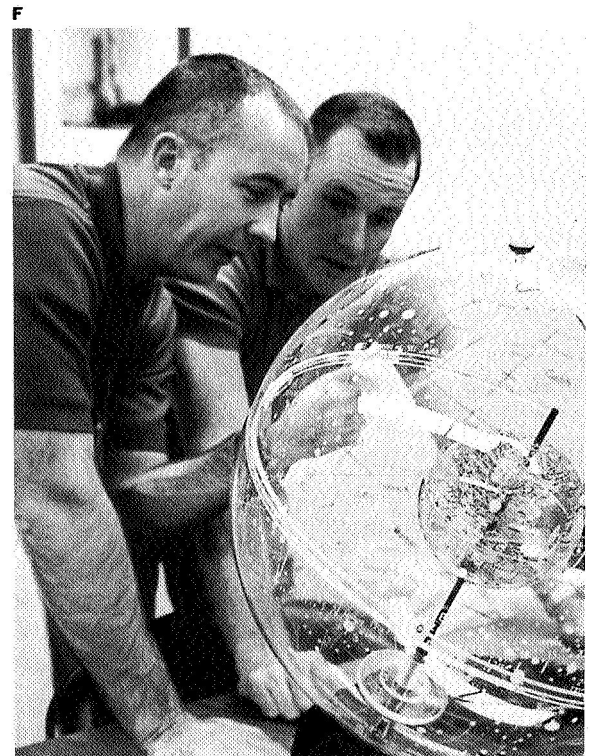
**E**

Pilots of Gemini missions gained experience in flying their spacecraft through controlled reentry maneuvers to preselected landing points. This was accomplished with remarkable accuracy.

Much of the information obtained in Mercury and Gemini is utilized in the Apollo Program with its primary objective of landing astronauts on the lunar surface and returning them to earth prior to 1970.

Many persons have asked why men volunteer for such assignments. There is no simple answer to this question, for each astronaut has strong individual characteristics. Perhaps the one characteristic found in each of them is a spirit of adventure—a desire to explore the unknown.

Each of the astronauts would like to be a member of the first crew to accomplish a lunar mission. All realize, however, that only three can fly that mission so each continues to participate in the extensive training programs required and thus make significant contributions to the effort required for ultimate success.



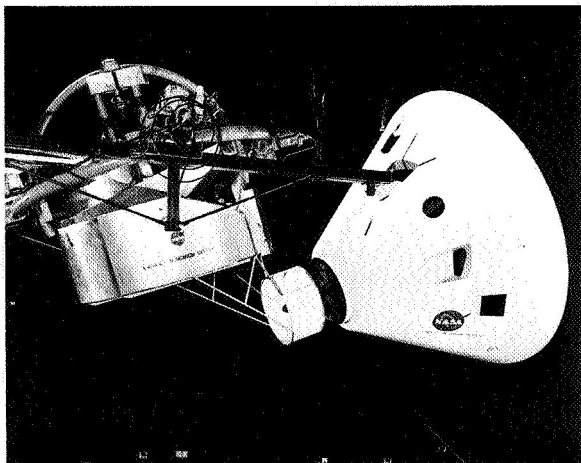
**F**

# ASTRONAUT TRAINING





G. Astronaut in Visual Docking Simulator during rendezvous training.

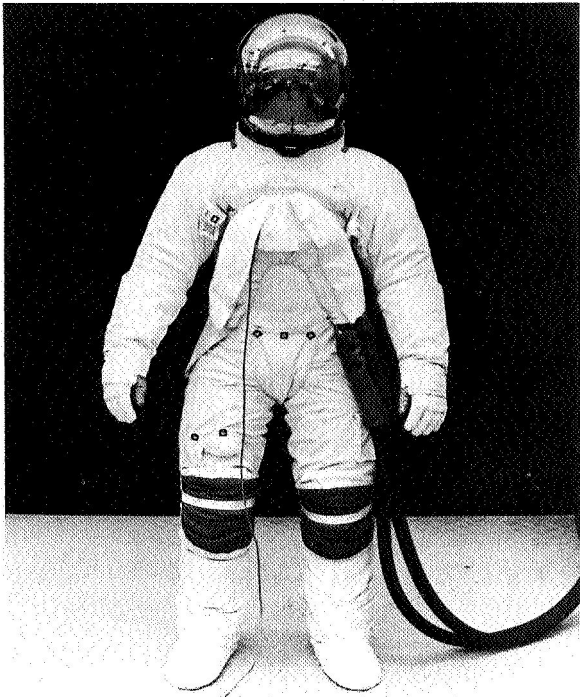


**B**asic objectives of astronaut training are:

1. To provide highly trained flight crew members who are capable of operating at peak efficiency in the space environment—either in normal flight or emergency situations, and
2. To provide crew members who are trained to conduct scientific experiments during manned space missions either by actively participating in such experiments or by serving as observers on passive experiments.

These objectives are met, primarily, through utilization of a number of formal training courses. Such courses include technological and scientific subjects, operations familiarization, environmental and contingency training, spacecraft and launch vehicle design and development, and an aircraft flight program.

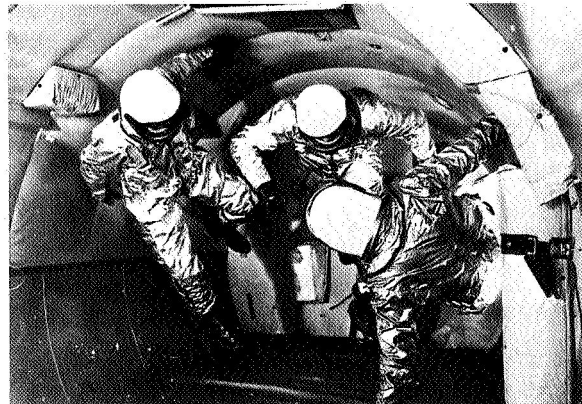
The courses in technology and science cover a variety of subjects such as space navigation, flight mechanics, astronomy (with emphasis on selenology, which is the study of the moon), physics of the upper atmosphere and space, bioastronautics, ad-



H

H. Astronaut in Apollo prototype space suit.

I. Weightlessness is experienced briefly in airplane flying parabolic arc.



I

vanced propulsion systems, aerodynamics, space communications, meteorology, geology, geophysics, geochemistry, guidance and control, and computer technology.

Computers are used extensively in guidance and navigation systems in both the Gemini and Apollo Programs. Astronauts assigned to Gemini flights were given a basic digital computer course prior to receiving advanced courses on the Gemini on-board computer. Similarly, crewmen assigned to Apollo flights are instructed in the basic principles of inertial guidance systems in the Apollo guidance and navigation course.

In the area of operations, the astronauts in each new group selected are given a thorough orientation on activities at NASA installations as well as at the plants of some of the contractors. This orientation is followed by more detailed briefings at a later time. Many of the astronauts are assigned specific operational duties during the manned flights.

In environmental familiarization training, astronauts are exposed to acceleration and deceleration g-forces, weightlessness, simulated lunar gravity, vibration and noise,

and other environmental factors. To achieve this, various special devices and techniques had to be developed. For example, a device which supports five-sixths of the astronaut's weight is used to simulate lunar gravity. This provides the feeling to the astronaut that he weighs only one-sixth of his normal weight. Weightlessness is experienced by the astronauts for extremely short periods of time in an aircraft which is flown in a parabolic arc.

Possibility of contingency landings is slight but astronauts must be prepared for any eventuality. Contingency training stresses survival techniques and is conducted in geographical locations where extreme environmental conditions exist. Tropical survival training is accomplished in Panama, desert survival training in western desert areas of the United States and water survival training in the Gulf of Mexico and Galveston Bay, near Houston.

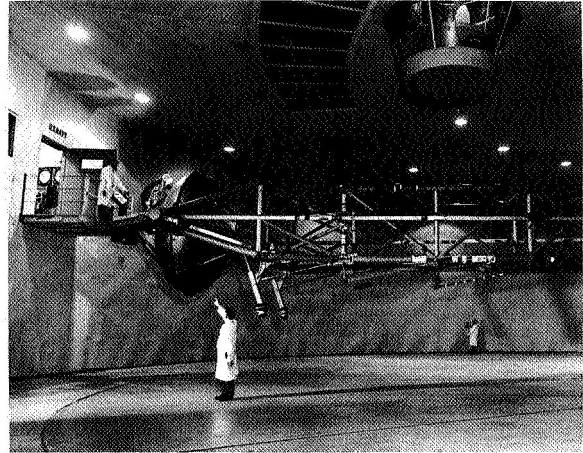
Astronauts are continually involved in study of spacecraft and launch vehicles. This training is accomplished through the study of basic handbooks on these vehicles, through instruction by NASA and contractor special-

ists, and by active participation in design engineering reviews and vehicle validation tests. This type of study and review extends to special equipment such as hand tools, the portable life support system, the tether, and other manned maneuvering devices, all designed for extravehicular activity; and to personal equipment, such as pressure suits, with different suit configurations to meet special mission requirements.

Aircraft flight training is accomplished primarily in T-33 and T-38 aircraft and each astronaut is required to log a minimum of 100 hours flying time each year. They also receive helicopter flight instruction because of the similarity of this activity to landing the lunar module on the moon. Since actual space flight opportunity is so limited, this training is vital to astronauts in maintaining their "flight readiness."

When a crew is named for a mission, its members undertake an intensive program geared to preparing them to a point of maximum efficiency for their particular flight. Much time is devoted to flying simulated mis-

J. Astronaut entering centrifuge for test of "G" force effects.

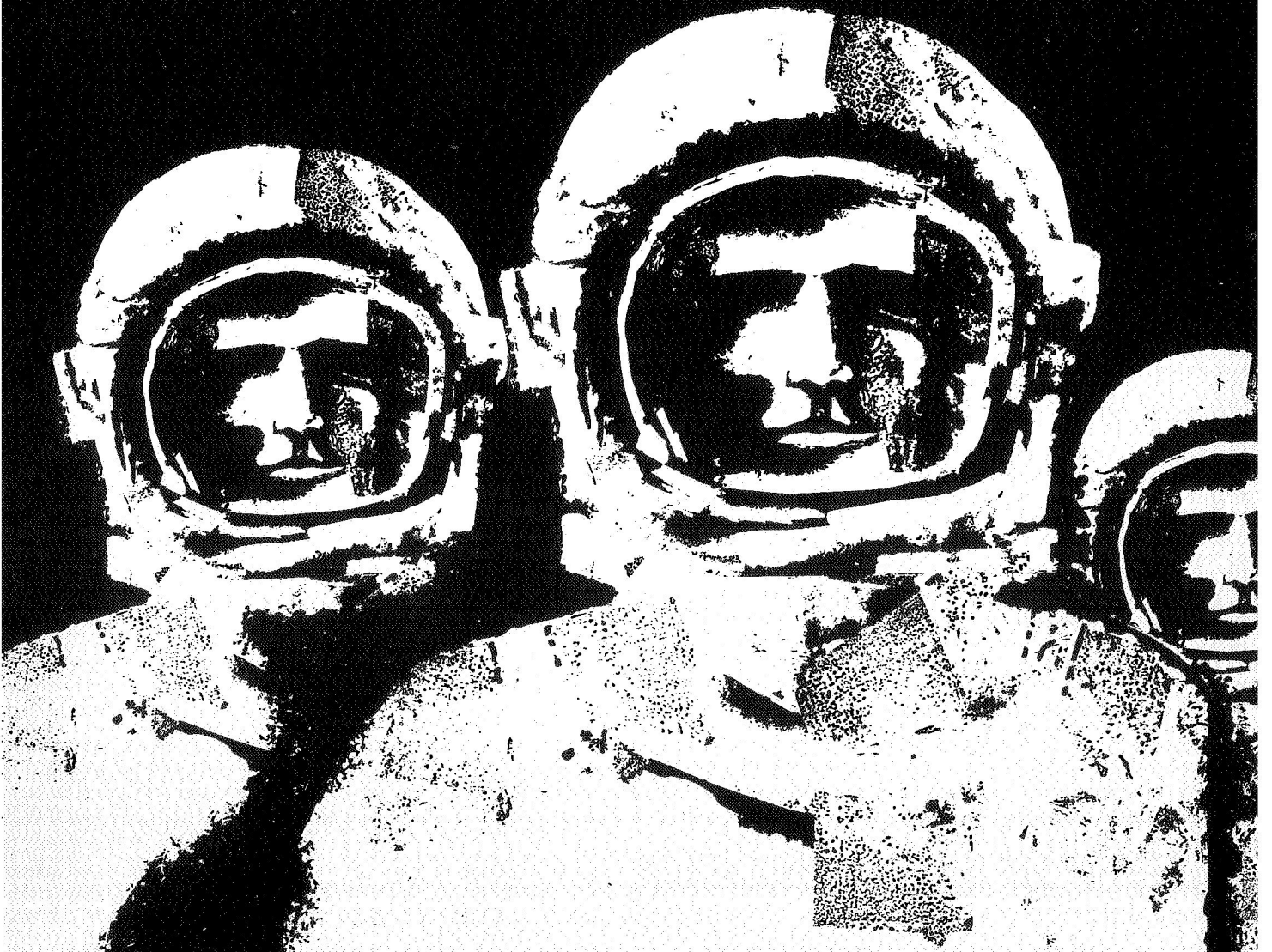


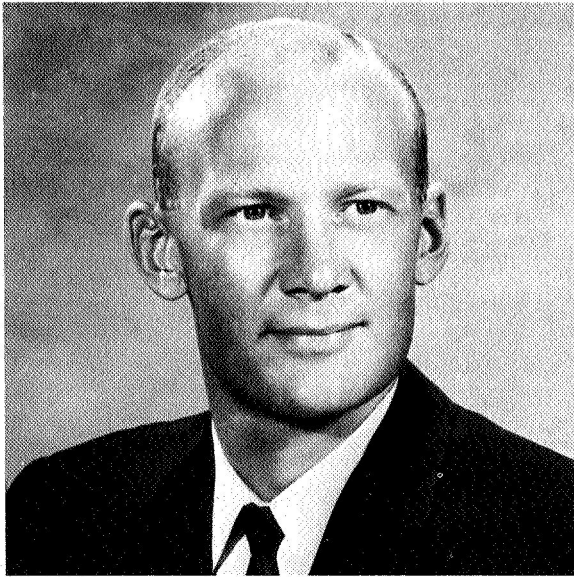
sions, reviewing pertinent subject material, and becoming thoroughly familiar with the experiments to be conducted on their mission. The assigned crew devotes major emphasis to their spacecraft. From the time they are assigned to a mission, they follow their spacecraft through the final phases of fabrication, through the many tests performed at the factory, altitude chamber runs of parts of the mission with the mission spacecraft, through additional tests at Cape Kennedy, and finally through the mating with the launch vehicle and additional combined tests on the launch pad prior to the scheduled lift-off.

Physical fitness is very important in a program which inflicts the stresses that are induced by manned space flight. All astronauts are in top physical condition when they are selected and NASA holds them personally responsible for maintaining such conditions. Therefore, due to the other requirements of the overall training program, each astronaut undertakes a physical fitness program tailored to his own needs.



# THE TEAM





**EDWIN E. ALDRIN, JR.**

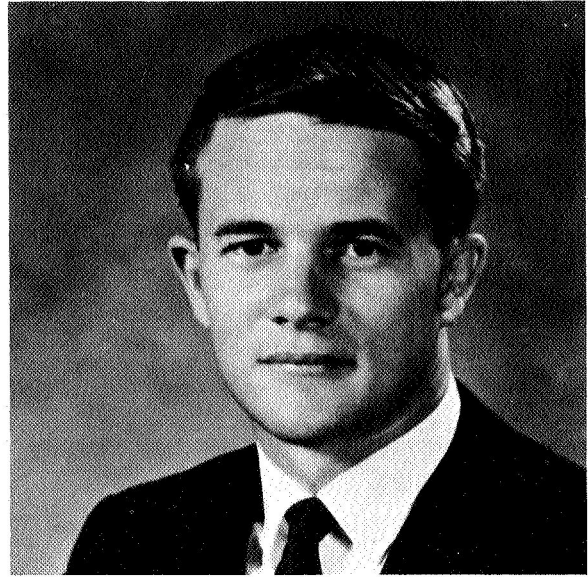
was born in Montclair, New Jersey, January 20, 1930. He was graduated from the United States Military Academy in 1951 with a bachelor of science degree.

A member of the United States Air Force, Aldrin completed his pilot training at Bryan, Texas, in 1952. He flew combat missions during the Korean conflict; he also served a tour as aerial gunnery instructor at Nellis Air Force Base, Nevada, and attended Squadron Officers' School at the Air University, Maxwell Air Force Base, Alabama. Aldrin flew as a flight commander with the 36th Tactical Fighter Wing at Bitburg, Germany.

Aldrin completed work for his doctor of science degree in astronautics at Massachusetts Institute of Technology in 1963 and was assigned to the Gemini Target Office of the Air Force Space Systems Division, Los Angeles, California. He was later assigned to the Manned Spacecraft Center, Houston, Texas, to coordinate Department of Defense participation in Gemini experiments.

He was one of the 14 astronauts selected by NASA in October 1963. He was pilot of the backup crew for the Gemini IX mission and pilot for the Gemini XII flight. He has received the NASA Exceptional Service Medal for his space flight achievements.

Aldrin is married to the former Joan A. Archer of Ho-Ho-Kus, New Jersey. They have three children: James, born September 2, 1955; Janice, born August 16, 1957; and Andrew, born June 17, 1958.



**JOSEPH P. ALLEN IV**

was born June 27, 1937, in Crawfordsville, Indiana. He received a bachelor of arts degree in math-physics from DePauw University in 1959, a master of science degree in physics from Yale University in 1962, and a doctorate in physics (nuclear physics) from Yale in 1965.

Allen was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, Allen was a research associate at the University of Washington, Seattle.

He is married to the former Bonnie Jo Darling of Elkhart, Indiana. They have no children.

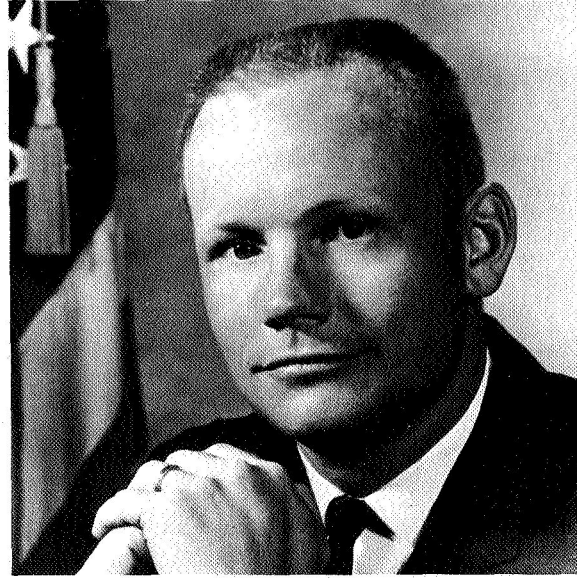


### WILLIAM A. ANDERS

was born in Hong Kong, October 17, 1933. He was graduated from the United States Naval Academy with a bachelor of science degree in 1955. After graduation, Anders was commissioned in the Air Force and received flight training. He received his master of science degree in nuclear engineering from the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. In 1962 he served as a nuclear engineer and instructor pilot at the Air Force Weapons Laboratory, Kirtland Air Force Base, New Mexico.

Anders was one of the 14 astronauts selected by NASA in October 1963. He was pilot of the backup crew for the Gemini XI mission.

Anders is married to the former Valerie E. Hoard of Lemon Grove, California. They have five children: Alan, born February 18, 1957; Glen, born July 3, 1958; Gayle, born December 30, 1960; Gregory, born December 10, 1962; and Eric, born July 6, 1964.



### NEIL A. ARMSTRONG

was born in Wapakoneta, Ohio, August 5, 1930. He graduated from Purdue University with a bachelor of science degree in aeronautical engineering in 1955.

Armstrong was a naval aviator from 1949 to 1952 and flew combat missions during the Korean conflict.

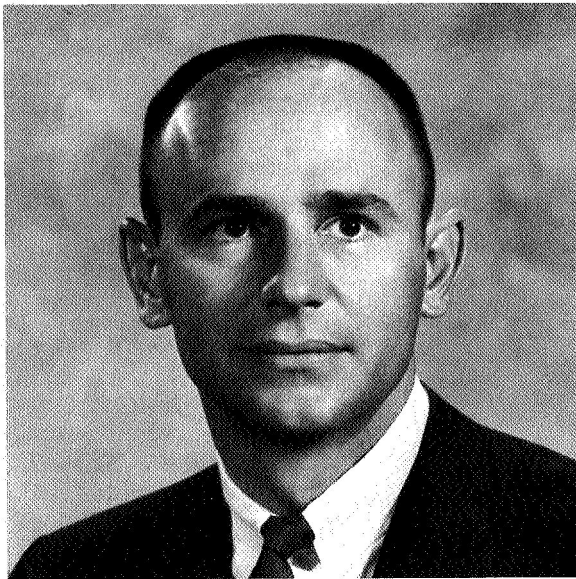
After graduation from Purdue University, Armstrong joined the NASA Lewis Flight Propulsion Laboratory, and later transferred to NASA's High Speed Flight Station at Edwards Air Force Base, California. As an aeronautical research pilot, Armstrong was an X-15 project pilot flying that aircraft to over 200,000 feet and at approximately 4000 miles per hour. Other flight test work included piloting the X-1 rocket research airplane, the F-100, the F-101, F-102, F-104, F5D, B-47, and the glider.

Armstrong was one of the nine astronauts selected by NASA in September 1962. Armstrong was command pilot for the Gemini VIII mission flown March 16, 1966, and backup command pilot for the Gemini V and XI missions.

He is the recipient of the 1962 Institute of Aeronautical Sciences Octave Chanute Award and the NASA Exceptional Service Award for his work in manned space flight.

Armstrong is married to the former Janet Shearon of Evanston, Illinois. They have two children: Eric, born June 30, 1957; and Mark, born April 8, 1963.





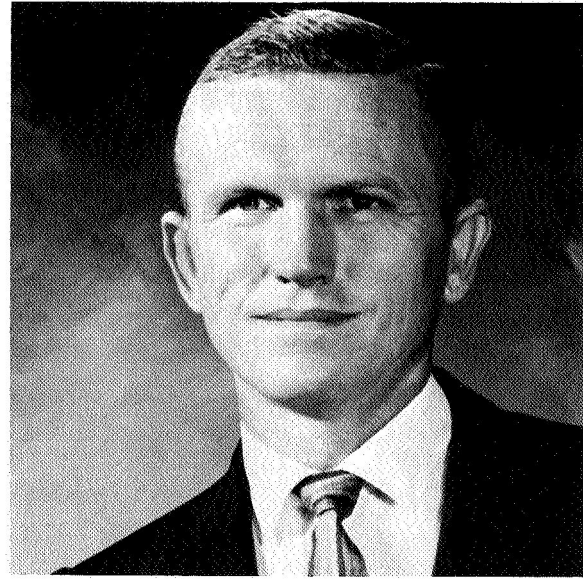
### ALAN L. BEAN

born in Wheeler, Texas, March 15, 1932, was graduated from the University of Texas in 1955 with a bachelor of science degree in aeronautical engineering.

After graduation, Bean was commissioned in the United States Navy. He received pilot training and was assigned to Attack Squadron 44 at Jacksonville Naval Station for four years. He then attended the Navy Test Pilot School at Patuxent, Maryland, and served as project officer there on various aircraft for Navy preliminary evaluation, initial trials, and final board of inspections and survey trials. Bean's last Navy assignment was with Attack Squadron 172 at Cecil Field, Florida.

Bean was selected by NASA as one of 14 chosen in October 1963. He was the command pilot for the backup crew for the Gemini X mission.

He is married to the former Sue Ragsdale of Dallas, Texas. The Beans have two children: Clay, born December 18, 1955; and Amy, born January 21, 1963.



### FRANK BORMAN

was born in Gary, Indiana, March 14, 1928. Raised in Tucson, Arizona, he graduated from the United States Military Academy in 1950 with a bachelor of science degree.

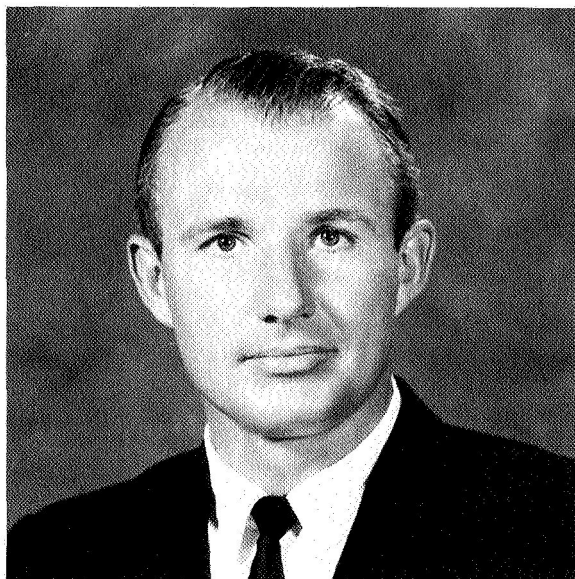
After receiving pilot training at Williams Air Force Base, Arizona, he was assigned to various fighter squadrons in the United States and the Philippines. In 1957 he became an instructor in thermodynamics and fluid mechanics at the Military Academy.

Borman received a master's degree in aeronautical engineering from California Institute of Technology in 1957. He was graduated from the USAF Aerospace Research Pilots School in 1960 and remained there as an instructor until 1962.

Borman was one of the nine astronauts selected by NASA in September 1962. He was command pilot for the Gemini VII mission, which established a number of records, including the longest manned space flight performed up to that time (330 hours and 35 minutes). He participated in the first rendezvous of two manned maneuverable spacecraft (Gemini VII and Gemini VI) on December 15, 1965.

Borman has been awarded the NASA Exceptional Service Award and was co-recipient of the 1966 Harmon International Aviation Trophy for his space flight achievements.

He is married to the former Susan Bugbee of Tucson, Arizona. The Bormans have two children: Frederick, born October 4, 1951; and Edwin, born July 20, 1953.



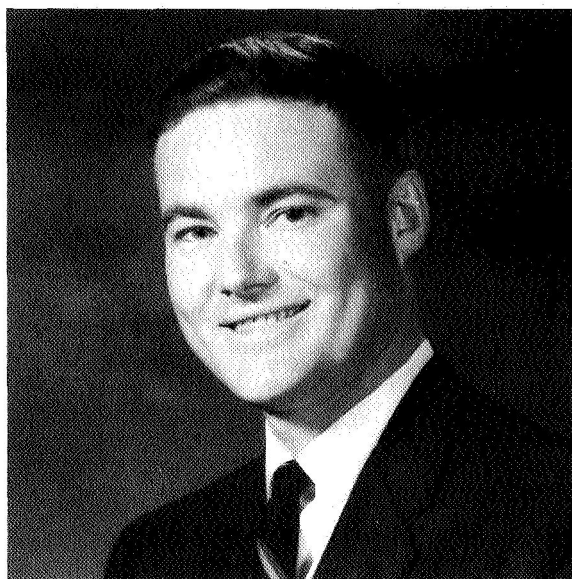
### VANCE D. BRAND

was born in Longmont, Colorado, May 9, 1931. He received a bachelor of science degree in business administration from the University of Colorado in 1953, and a bachelor of science degree in aeronautical engineering from the same university in 1960. Brand received a master's degree in business administration from the University of California at Los Angeles in 1964.

He served with the United States Marine Corps as a commissioned officer from 1953 to 1957. Brand completed naval flight training in 1955 and subsequently was designated a naval aviator and served a 15-month tour of duty in Japan as a jet fighter pilot.

Brand was one of the 19 astronauts selected by NASA in April 1966. Prior to his selection, he was assigned as an engineering test pilot for Lockheed Aircraft Corporation at the West German F-104G Flight Test Center at Istres, France. He worked for Lockheed from 1960 to 1966 and was employed initially as a flight test engineer. He later attended the U.S. Naval Test Pilot School at Patuxent River, Maryland, as a civilian under Lockheed sponsorship.

He is married to the former Joan Virginia Weninger of Chicago, Illinois. The Brands have four children: Susan, born April 30, 1954; Stephanie, born August 6, 1955; Patrick, born March 22, 1958; and Kevin, born December 1, 1963.



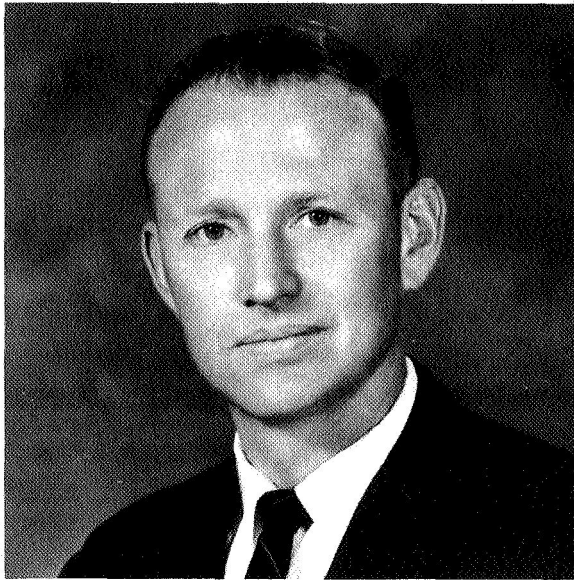
### JOHN S. BULL

was born in Memphis, Tennessee, September 25, 1934. He received a bachelor of science degree in mechanical engineering from Rice University in 1957.

He entered active duty with the Navy in June 1957 and received his flight training at Kingsville, Texas. From March 1959 to November 1960, he flew F-3 Demons while assigned to Fighter Squadrons 121 and 92. He was later assigned to Fighter Squadron 114 at the Naval Air Station, Miramar, California, where he flew the F-3 Demon and the F-4 Phantom II. He has also been assigned to carrier duty in the western Pacific on three different tours. He graduated from the United States Naval Test Pilot School in February 1964, and his last assignment prior to his selection as an astronaut was as a project test pilot in the Carrier Suitability Branch at the Naval Air Test Center, Patuxent River, Maryland.

Bull was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Nancy Laraine Gustafson of Seattle, Washington. The Bulls have one child, Jeffrey, born July 27, 1965.



### GERALD P. CARR

was born in Denver, Colorado, August 22, 1932. He received a bachelor of science degree in mechanical engineering from the University of Southern California in 1954; a bachelor of science degree in aeronautical engineering from the U.S. Naval Postgraduate School in 1961; and a master of science degree in aeronautical engineering from Princeton University in 1962.

He entered the United States Navy in 1949. Upon his graduation from the University of Southern California in 1954, he received his commission in the Marine Corps. He received flight training at Pensacola, Florida, and Kingsville, Texas. He was then assigned to Marine All-Weather Fighter Squadron 114. From 1962 to 1965, he served with Marine All-Weather Fighter Squadron 122 in the United States and the Far East. His last assignment prior to his selection as an astronaut was with the Test Directors Section, Marine Air Control Squadron 3, a unit responsible for carrying out testing and evaluation of Marine tactical data systems.

Carr was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former JoAnn Ruth Petrie of Santa Ana, California. The Carrs have six children: Jennifer, born July 31, 1955; Jamee and Jeffrey, born July 3, 1958; John, born April 4, 1962; and Jessica and Joshua, born March 12, 1964.



### EUGENE A. CERNAN

was born in Chicago, Illinois, March 14, 1934. He was graduated from Purdue University in 1956 with a bachelor of science degree in electrical engineering.

Cernan was commissioned by the United States Navy after completing the Navy Reserve Officer Training Corps program at Purdue and entered flight training. He was assigned to Attack Squadrons 126 and 113 at Miramar, California, Naval Air Station. In 1961, Cernan entered the United States Naval Postgraduate School at Monterey, California, where he received a master of science degree in aeronautical engineering.

Cernan was one of the 14 astronauts selected by NASA in October 1963. Cernan was pilot for the Gemini IX mission launched June 3, 1966, and performed a two hour and seven minute space walk (extra vehicular activity). He was pilot of the back-up crew for Gemini XII.

He received the NASA Exceptional Service Medal for his space flight accomplishments during the Gemini IX mission.

Cernan is married to the former Barbara J. Atchley of Houston, Texas. They have one daughter, Teresa, born March 4, 1963.





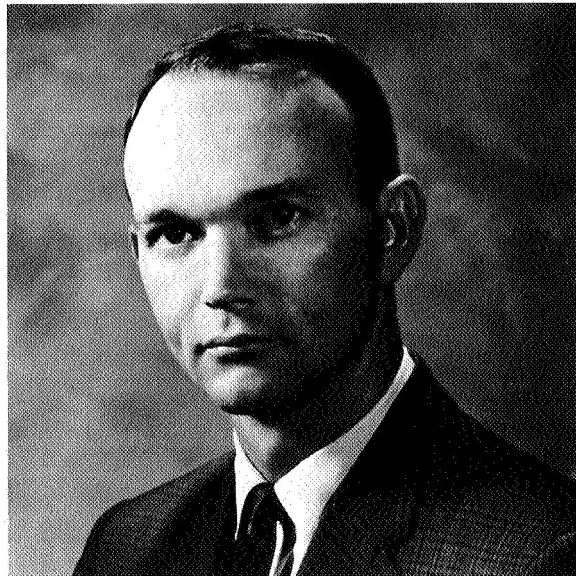
### PHILIP K. CHAPMAN

was born March 5, 1935, in Melbourne, Australia. Chapman became a United States citizen on May 8, 1967. He received a bachelor of science degree in physics from Sydney University (Australia) in 1956, and a master of science degree in aeronautics and astronautics from Massachusetts Institute of Technology (M.I.T.) in 1964. He received his doctorate in physics (instrumentation) from M.I.T. in 1967.

Chapman was an auroral/radio physicist with the Antarctic Division, External Affairs Department, Commonwealth of Australia from 1957 through 1959. He was with the Australia National Antarctic Research Expedition, IGY, in 1958. In 1960 and 1961 Chapman was a staff engineer in electro-optics with Canadian Aviation Electronics, Dorval, Quebec. Prior to his selection as a scientist-astronaut he was a staff physicist in the Experimental Astronomy Laboratory at M.I.T.

Chapman was one of eleven scientist-astronauts selected by NASA in August 1967.

Married to the former Pamela Gatenby of Herberton, Queensland, the Chapmans have one child, Peter Hume, born in 1960.



### MICHAEL COLLINS

was born in Rome, Italy, October 31, 1930. He attended the United States Military Academy and was graduated in 1952 with a bachelor of science degree.

After graduation, Collins was commissioned by the United States Air Force and served as an experimental flight test officer at the Air Force Flight Test Center, Edwards Air Force Base, California. He tested performance, stability, and control characteristics of Air Force aircraft, primarily jet fighters.

Collins was one of 14 astronauts selected by NASA in October 1963. He served as backup pilot for the Gemini VII mission. He was pilot of the prime crew for Gemini X launched July 18, 1966, and during that mission Collins proved man's capability for performing extravehicular tasks relative to a target vehicle. He performed three separate periods of extravehicular activity during this flight.

He received the NASA Exceptional Service Medal for his accomplishments on the Gemini X mission.

Collins is married to the former Patricia M. Finnegan of Boston, Massachusetts. They have three children: Kathleen, born May 6, 1959; Ann, born October 31, 1961; and Michael, born February 23, 1963.



**CHARLES CONRAD, JR.**

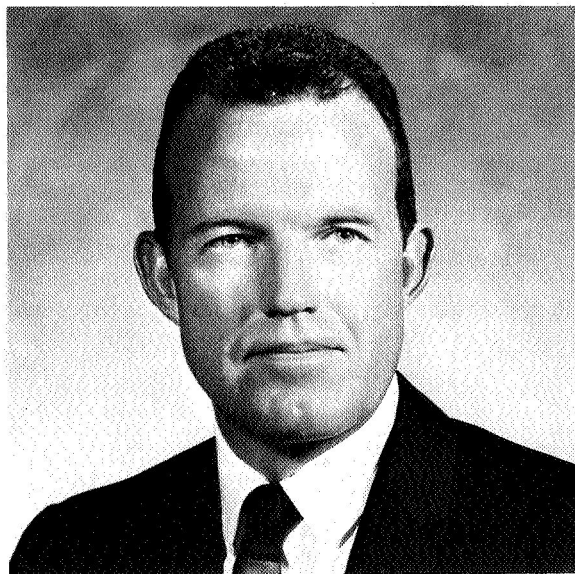
was born in Philadelphia, Pennsylvania, June 2, 1930. He was graduated from Princeton University in 1953 with a bachelor of science degree in aeronautical engineering.

He entered the Navy following his graduation from Princeton. Conrad attended the Navy Test Pilot School at Patuxent River, Maryland, and following completion of that course was a project test pilot in the Armaments Test Division there. He also served at Patuxent as a flight instructor and performance engineer. Just prior to his selection as an astronaut, Conrad served as safety officer for Fighter Squadron 96 at the Naval Air Station, Miramar, California.

Conrad was one of nine astronauts selected by NASA in September 1962. Conrad was pilot on the Gemini V endurance mission launched from Cape Kennedy on August 21, 1965. He was backup command pilot for the Gemini VIII mission and command pilot on Gemini XI launched September 12, 1966.

He was awarded the NASA Exceptional Service Medals for his Gemini V and XI space flight accomplishments.

Conrad is married to the former Jane DuBose of Uvalde, Texas. They have four children: Peter, born December 24, 1954; Thomas, born May 3, 1957; Andrew, born April 30, 1959; and Christopher, born November 26, 1960.



**L. GORDON COOPER, JR.**

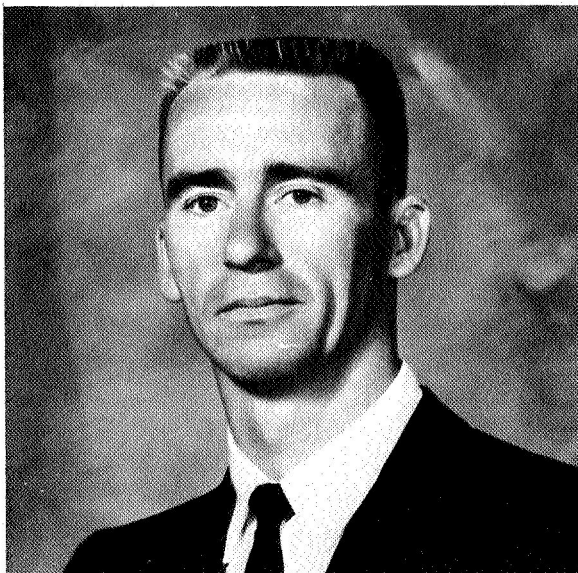
was born March 6, 1927, in Shawnee, Oklahoma. He was graduated from the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, in 1956 with a bachelor of science degree in aeronautical engineering.

Cooper entered the United States Marine Corps in 1945 and later attended the Naval Academy Preparatory School. He was a member of the Presidential Honor Guard in Washington until his discharge in August 1946. Cooper entered the University of Hawaii, Honolulu, and received an Army commission after attending for three years. He transferred this commission to the Air Force and entered flight training in 1949. Upon completion of this training, Cooper flew with the 86th Fighter Bomber Group in Munich, Germany, for four years. After graduating from the Air Force Institute in 1956, he was assigned to the Air Force Experimental Flight Test School at Edwards Air Force Base, California.

Cooper, one of seven astronauts selected in April 1959, on May 15 1963, piloted MA-9 spacecraft on a 22-orbit mission. Cooper was command pilot for the Gemini V flight launched from Cape Kennedy, August 21, 1965. He was also assigned as command pilot of the back-up crew for Gemini XII.

He has been awarded the NASA Distinguished Service Medal and the NASA Exceptional Service Medal.

Cooper is married to the former Trudy Olson of Seattle, Washington. They have two daughters: Camala, born November 16, 1948; and Janita, born March 15, 1950.



### R. WALTER CUNNINGHAM

was born March 16, 1932, at Creston, Iowa. Reared in Venice, California, he received a bachelor of arts degree in physics from the University of California at Los Angeles (UCLA) in 1960 and a master of arts degree in physics in 1961 from that same university.

Cunningham joined the United States Navy in 1951 and entered flight training in 1952. He was assigned to a Marine squadron in 1953 and remains a Marine reservist.

Prior to his selection as an astronaut, Cunningham was with the Rand Corporation where he worked as a research scientist. He performed error analysis and feasibility studies of defense against submarine-launched ballistic missiles and problems of the earth's magnetosphere. His later work at UCLA was the developing, testing, and analyzing results of a triaxial search coil magnetometer which was flown aboard the first NASA Orbiting Geophysical Observatory satellite.

Cunningham was one of the 14 astronauts selected by NASA in October 1963.

He is married to the former Lo Ella Irby of Norwalk, California. The Cunninghams have two children: Brian, born September 12, 1960; and Kimberly, born February 12, 1963.



### CHARLES M. DUKE, JR.

was born in Charlotte, North Carolina, October 3, 1935. He received a bachelor of science degree from the United States Naval Academy in 1957 and a master of science degree in aeronautics and astronautics from the Massachusetts Institute of Technology in 1964.

He was commissioned in the United States Air Force in 1957, upon graduation from the Naval Academy. He completed flight training in 1958, and was later assigned to the 526th Fighter Interceptor Squadron at Ramstein, Germany, where he served three years as a fighter interceptor pilot. His last assignment prior to his selection as an astronaut was as instructor in control systems at the Air Force Aerospace Research Pilot School, from which he graduated in 1965.

Duke was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Dorothy Meade Claiborne of Atlanta, Georgia. The Dukes have two children, Charles, born March 8, 1965; and Thomas, born May 1, 1967.





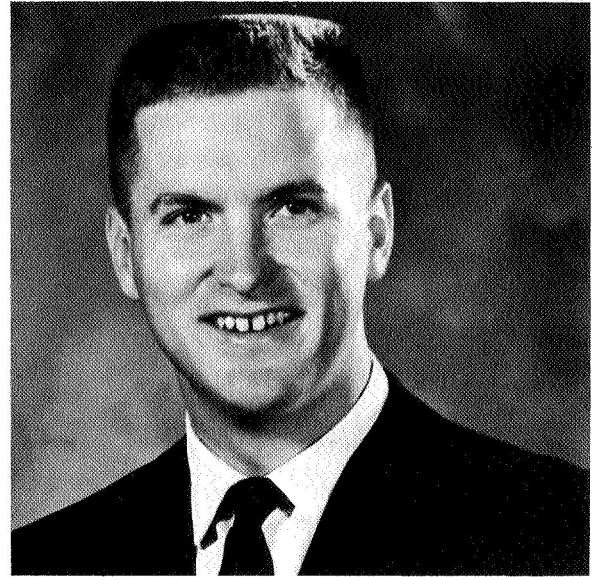
**DONN F. EISELE**

was born in Columbus, Ohio, June 23, 1930. He received a bachelor of science degree from the United States Naval Academy in 1952 and in 1960 he received a master of science degree in astronautics from the Air Force Institute of Technology at Wright-Patterson Air Force Base, Ohio.

After graduation from the United States Naval Academy, Eisele chose the United States Air Force as a career. He completed flight training, and later was graduated from the Air Force Aerospace Research Pilot School, Edwards Air Force Base, California. He served as project engineer and experimental test pilot at the Air Force Special Weapons Center, Kirtland Air Force Base, New Mexico. He flew experimental and developmental test flights in jet aircraft in support of special weapons developmental programs.

Eisele was one of the 14 astronauts selected by NASA in October 1963.

He is married to the former Harriet E. Hamilton of Gnaddenhutten, Ohio, and the Eiseles have four children: Melinda, born July 25, 1954; Donn, born March 24, 1956; Matthew, born August 28, 1961; and Jon, born October 21, 1964.



**ANTHONY W. ENGLAND**

was born May 15, 1942, at Indianapolis, Indiana. He received a bachelor of science degree in geology and physics from the Massachusetts Institute of Technology (M.I.T.) in 1965, a master of science degree in geology and physics from M.I.T. in 1965, and a doctorate in geophysics from M.I.T. in 1967.

England was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, England was a graduate fellow at M.I.T.

He is married to the former Kathleen Ann Kreutz of Fargo, North Dakota. They have no children.




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**JOE H. ENGLE**

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was born in Abilene, Kansas, August 26, 1932. He received a bachelor of science degree in aeronautical engineering from the University of Kansas in 1955.

He was commissioned in the United States Air Force through the Reserve Officer Training Corps program at the University of Kansas and entered flying school in 1957. Upon completion of flight training, he served with the 474th Fighter Day Squadron and the 309th Tactical Fighter Squadron at George Air Force Base, California. He had assignments in Spain, Italy, and Denmark. In 1961, Engle was graduated from the Experimental Flight Test Pilot School and from the Air Force Aerospace Research Pilot School in 1962. His last assignment prior to being selected as an astronaut was as an aerospace flight test pilot in the X-15 research program at Edwards Air Force Base, California.

Engle was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Mary Catherine Lawrence of Mission Hills, Kansas. They have two children: Laurie, born April 25, 1959; and Jon, born May 9, 1962.




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**RONALD E. EVANS**

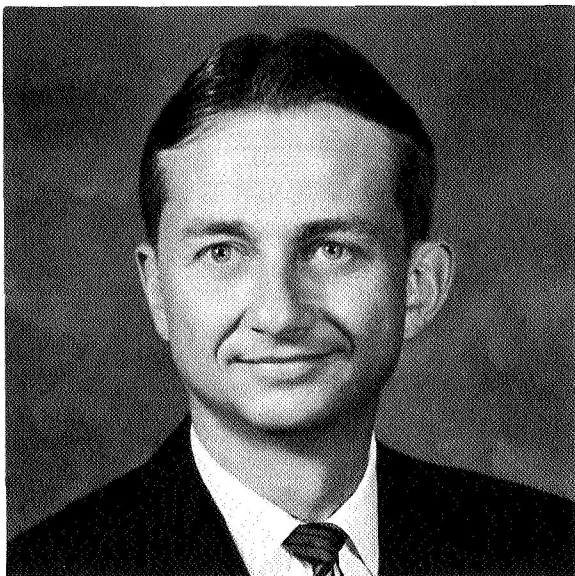
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was born in St. Francis, Kansas, November 10, 1933. He received a bachelor of science degree in electrical engineering from the University of Kansas in 1956, and a master of science degree in aeronautical engineering from the U.S. Naval Postgraduate School in 1964.

He was commissioned through the Reserve Officer Training Corps program and completed flight training in 1957. He had carrier duty with two cruises and was assigned to Fighter Squadron 124 in 1961 and 1962, where he served as combat flight instructor on F8 aircraft. His last assignment prior to being selected as an astronaut was on carrier duty flying F8 aircraft in Viet Nam combat operations.

Evans was one of the 19 astronauts selected by NASA in April 1966.

Evans is married to the former Janet Merle Pollom of Topeka, Kansas. They have two children: Jaime, born August 21, 1959; and Jon, born October 9, 1961.



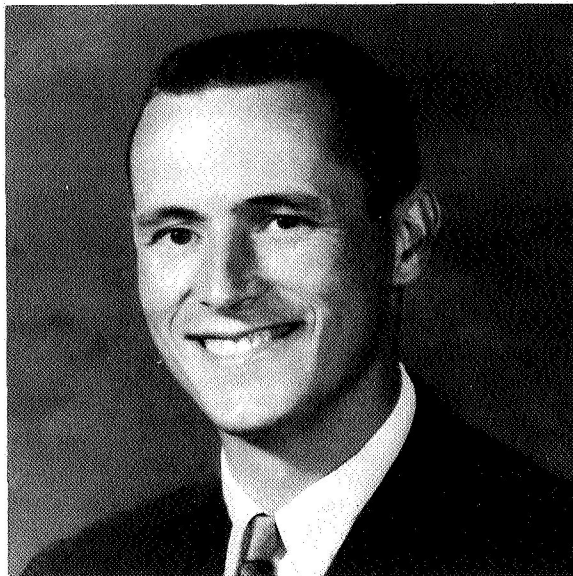
**OWEN K. GARRIOTT**

was born November 22, 1930, at Enid, Oklahoma. He was graduated from the University of Oklahoma in 1953 with a bachelor's degree in electrical engineering. He was graduated from Stanford University, Stanford, California in 1957 with a master's degree in electrical engineering. He received his doctorate from Stanford in 1960.

Garriott was a consultant to the Manned Space Science Division of NASA's Office of Space Sciences and Applications. He was consultant to the Lockheed Corporation's Space Physics branch. Garriott has served as secretary to the United States Commission, International Scientific Radio Union, and was regional editor of *Planetary and Space Sciences*. From 1961 until 1965, Garriott taught electronics, electromagnetic theory and ionospheric physics at Stanford University and has performed research in ionospheric physics since obtaining his doctorate at Stanford.

Garriott was one of the six scientist-astronauts selected by NASA in June 1965. He completed flight training at Williams Air Force Base, Arizona in 1966.

He is married to the former Helen Mary Walker of Enid, Oklahoma. The Garriotts have four children: Randall, born March 29, 1955; Robert, born December 7, 1956; Richard, born July 4, 1961; and Linda, born September 7, 1966.



**EDWARD G. GIBSON**

was born November 8, 1936 at Buffalo, New York. He was graduated from the University of Rochester, New York, with a bachelor of science degree and from the California Institute of Technology with a master of science degree. He received his doctorate in engineering physics from the California Institute of Technology in June 1964.

Gibson was a research assistant specializing in jet propulsion and atmospheric physics while studying at the California Institute of Technology. He also wrote several technical papers including some on his work with lasers. After receiving his doctorate, Gibson did aerospace research with the Philco Corporation's Applied Research Laboratories, Newport Beach, California.

Gibson was one of the six scientist-astronauts selected by NASA in June 1965. He completed flight training at Williams Air Force Base, Arizona, in 1966.

Married to the former Julia Ann Volk of the Township of Tonawanda, New York, the Gibsons have two children: Jannet, born November 9, 1960; and John, born May 2, 1964.





**RICHARD F. GORDON, JR.**

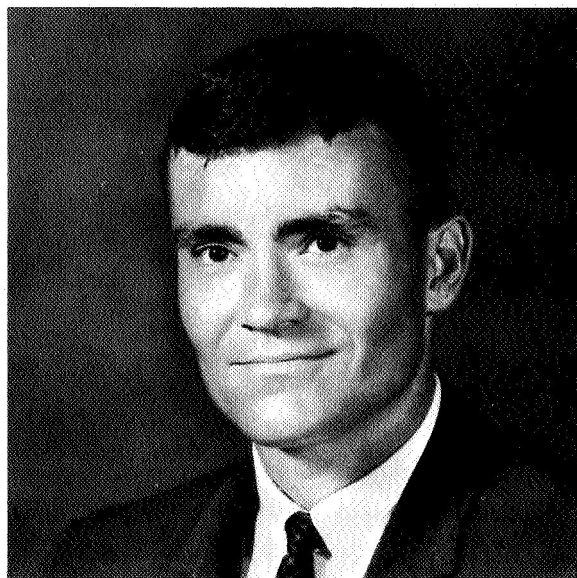
was born in Seattle, Washington, October 5, 1929. He received his bachelor of science degree in chemistry from the University of Washington in 1951.

Gordon entered the United States Navy in 1951 and received his naval aviator wings in 1953. He attended All-Weather Flight School and received jet transitional training before reporting to an all-weather squadron at the Naval Air Station, Jacksonville, Florida. Gordon attended the Navy's Test Pilot School at Patuxent River, Md., in 1957, and serving as a flight test pilot, was the first project test pilot for the F4H Phantom II.

In May 1961, Gordon won the Bendix Trophy Race from Los Angeles, California, to New York, establishing a new speed record of 869.74 miles per hour and a transcontinental record of two hours and 47 minutes.

Gordon was one of the 14 astronauts selected by NASA in October 1963. Gordon was pilot of the backup crew for the Gemini VIII flight and pilot of the prime crew for the Gemini XI mission launched September 12, 1966. He was awarded the NASA Exceptional Service Medal for his accomplishments on that flight.

He is married to the former Barbara Field of Seattle, Washington. The Gordons have six children: Carleen, born July 8, 1954; Richard, born October 6, 1955; Lawrence, born December 18, 1957; Thomas, born March 25, 1959; James, born April 26, 1960; and Diane, born April 23, 1961.



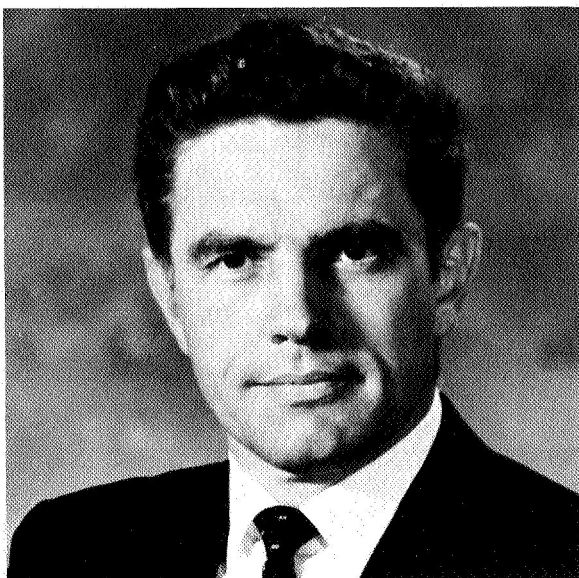
**FRED W. HAISE, JR.**

was born in Biloxi, Mississippi, November 14, 1933. He received a bachelor of science degree in aeronautical engineering from the University of Oklahoma in 1959.

He served with the United States Navy, beginning in 1952, and was assigned as a U.S. Marine Corps fighter pilot from 1954 to 1956. From 1957 to 1959, he was a fighter-interceptor pilot with the Oklahoma Air National Guard. He served with the Air Force in 1961 and 1962, and was awarded the A. B. Honts Trophy as the outstanding graduate from the Aerospace Research Pilot School in 1964.

Haise was one of the 19 astronauts selected by NASA in April 1966. Prior to his selection, he was a research pilot at the NASA Flight Research Center at Edwards, California. From September 1959 to March 1963, he was a research pilot at the NASA Lewis Research Center in Cleveland, Ohio.

Haise is married to the former Mary Griffin Grant of Biloxi, Mississippi. They have three children: Mary, born January 25, 1956; Frederick, born May 13, 1958; and Stephen, born June 30, 1961.




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**KARL G. HENIZE**

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was born October 17, 1926, in Cincinnati, Ohio. He received a bachelor of arts degree in mathematics from the University of Virginia in 1947, and a master of arts degree in astronomy from the University of Virginia in 1948. In 1954 Henize received his doctorate in astronomy from the University of Michigan.

Henize was a Carnegie fellow at Mt. Wilson Observatory from 1954 to 1956, and a senior astronomer at the Smithsonian Astrophysical Observatory from 1956 to 1959. Prior to his selection as a scientist-astronaut he was a Professor of Astronomy at Northwestern University.

Henize was one of eleven scientist-astronauts selected by NASA in August 1967.

He is married to the former Caroline Rose Weber of Bay City, Michigan. They have three children: Kurt Gordon, born in 1955; Marcia Lynn, born in 1956; and Karen Skye, born in 1961.




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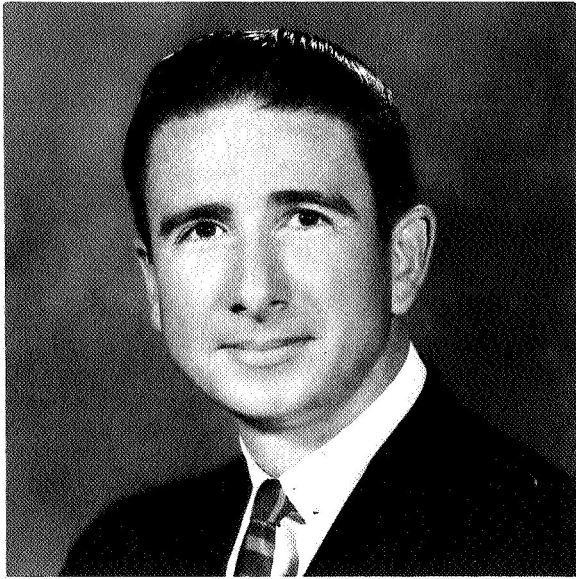
**DONALD L. HOLMQUEST**

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was born April 7, 1939, in Dallas, Texas. He received a bachelor of science degree in electrical engineering from Southern Methodist University in 1962. He received his M.D. from Baylor College of Medicine in 1967. Prior to his selection as a scientist-astronaut Holmquest was working on his doctorate in physiology at the Baylor College of Medicine. This degree is expected in 1968. He is also, concurrently, completing his internship at Methodist Hospital in Houston, Texas.

Holmquest was one of eleven scientist-astronauts selected by NASA in August 1967.

He is married to the former Charlotte Ann Blaha of Dallas, Texas. They have no children.



**JAMES B. IRWIN**

was born in Pittsburgh, Pennsylvania, on March 17, 1930. He received a bachelor of science degree from the U.S. Naval Academy in 1951 and a master of science degree in aeronautical engineering and instrumentation engineering from the University of Michigan in 1957.

He was commissioned in the United States Air Force in 1951 and received flight training at Hondo Air Base, Texas, and Reese Air Force Base, Texas. Irwin has served with the F-12 Test Force at Edwards Air Force Base, California, and the AIM 47 Project Office at Wright-Patterson Air Force Base, Ohio. He graduated from the Air Force Experimental Flight Test Pilot School in 1961, and from the Air Force Aerospace Research Pilot School in 1963. His last assignment prior to his selection as an astronaut was as chief of the Advanced Requirements Branch at Headquarters Air Defense Command.

Irwin was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Mary Ellen Monroe of Corvallis, Oregon. The Irwins have four children: Joy, born November 26, 1959; Jill, born February 22, 1961; James, born January 4, 1963; and Jan, born September 30, 1964.



**JOSEPH P. KERWIN**

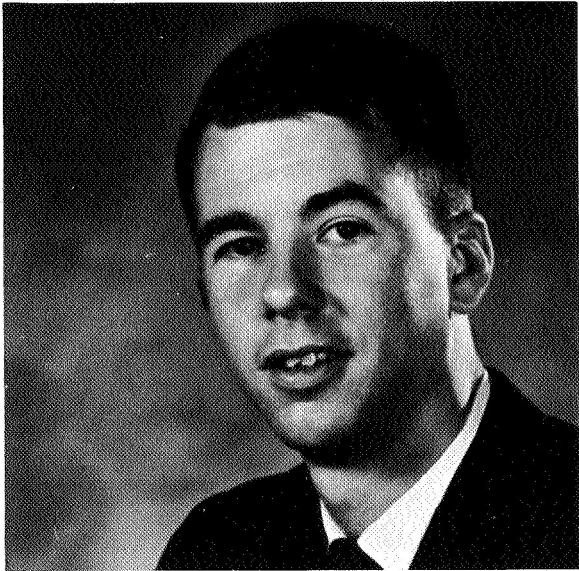
was born in Oak Park, Illinois, February 19, 1932. He was graduated from the College of the Holy Cross, Worcester, Massachusetts, with a bachelor of arts degree. Kerwin received his doctor of medicine degree from the Northwestern University Medical School, Chicago, Illinois, and completed his internship at the District of Columbia General Hospital, Washington, D.C., and at the United States Navy School of Aviation Medicine, Pensacola, Florida.

Kerwin entered the United States Navy in 1958. He completed flight training at Beeville, Texas, in 1962, and was named the outstanding student in his preflight class. Kerwin served two years as flight surgeon with Marine Air Group 14 at Cherry Point, North Carolina. He later served as flight surgeon for Fighter Squadron 101 at Oceana Naval Air Station, Virginia Beach, Virginia; he then became staff flight surgeon for Air Wing 4, Naval Air Station, Cecil Field, Florida.

Kerwin was one of the six scientist-astronauts selected by NASA in June 1965.

He is married to the former Shirley Good of Danville, Pennsylvania. The Kerwins have two children: Sharon, born September 14, 1963; and Joanna born January 5, 1966.





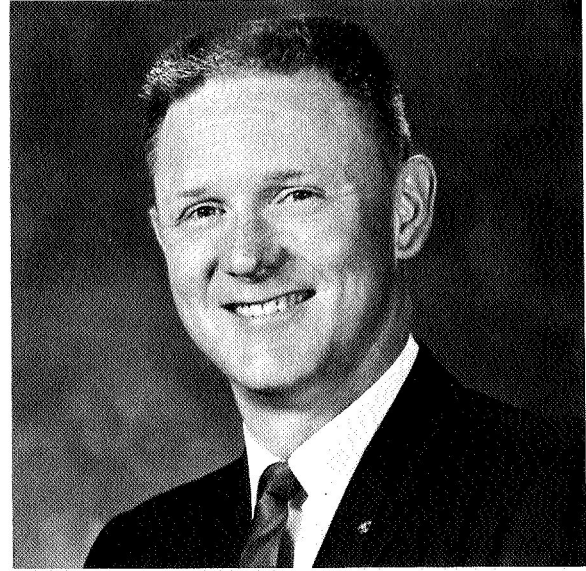
### WILLIAM B. LENOIR

was born March 14, 1939, in Miami, Florida. He received a bachelor of science degree in electrical engineering from the Massachusetts Institute of Technology in 1961, a master of science degree in electrical engineering from M.I.T. in 1962, and a doctorate in electrical engineering from M.I.T. in 1965.

Lenoir was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, Lenoir was an Assistant Professor of Electrical Engineering at M.I.T.

He is married to the former Elizabeth May Frost of Brookline, Massachusetts. They have one child, William B. Jr., born in 1965.



### DON L. LIND

was born in Murray, Utah, May 18, 1930. He received a bachelor of science degree in physics from the University of Utah in 1953, and a doctor of philosophy degree in high energy nuclear physics from the University of California in 1964.

He served with the United States Navy on active status from 1954 to 1957. Lind completed his flight training in 1955 and was subsequently assigned to carrier duty.

Lind was one of the 19 astronauts selected by NASA in April 1966. Prior to his selection, Lind worked at the NASA Goddard Space Flight Center as a space physicist, where he was involved in experiments to determine the nature and properties of low energy particles within the earth's magnetosphere and interplanetary space. Before 1964, he was employed at the Lawrence Radiation Laboratory, Berkeley, California, doing research in pion-nucleon scattering.

He is married to the former Kathleen Maughan of Logan, Utah. The Linds have five children: Carol, born January 24, 1956; David, born November 29, 1956; Dawna, born September 1, 1958; Douglas, born October 26, 1960; and Kimberly, born April 30, 1963.



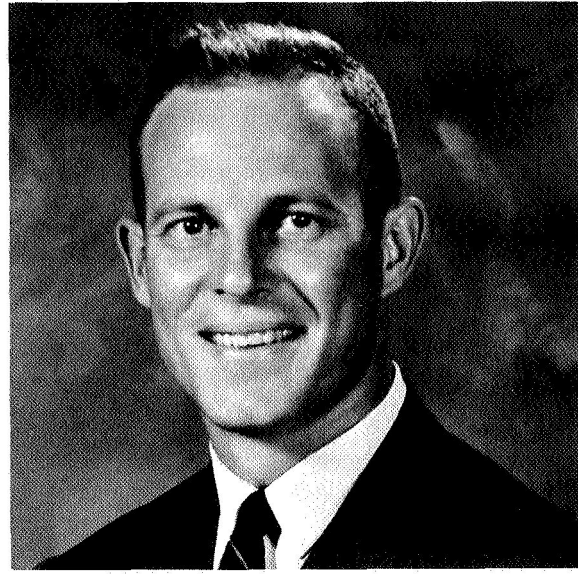
**JOHN A. LLEWELLYN**

was born April 22, 1933, in Cardiff, United Kingdom. Llewellyn became a United States citizen on February 17, 1966. He received a bachelor of science degree in chemistry from University College, Cardiff, in 1955, and a doctorate in chemistry from the same college in 1958.

Llewellyn was a research fellow, National Research Council of Canada from 1958 to 1960. Prior to his selection as a scientist-astronaut he was an Associate Professor at Florida State University.

Llewellyn was one of eleven scientist-astronauts selected by NASA in August 1967.

He is married to the former Valerie Davies-Jones of Cardiff, Wales. They have three children: Gareth Roger, born in 1957; Sian Pamela, born in 1962; and Ceri Elummed, born in 1967.



**JACK R. LOUSMA**

was born in Grand Rapids, Michigan, on February 29, 1936. He received a bachelor of science degree in aeronautical engineering from the University of Michigan in 1959 and the degree of "Aeronautical Engineer" from the U.S. Naval Postgraduate School in 1965.

He entered the United States Marine Corps in 1959 and completed flight training in 1960 at the U.S. Naval Air Training Command. He was assigned as an attack pilot, and subsequently served in Iwakuni, Japan. Lousma's last assignment before his selection as an astronaut was as a reconnaissance pilot at the Marine Air Station, Cherry Point, North Carolina.

Lousma was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Gratia Kay Smeltzer of Ann Arbor, Michigan. The Lousmas have two children, Timothy, born December 23, 1963 and Matthew, born July 14, 1966.



**JAMES A. LOVELL, JR.**

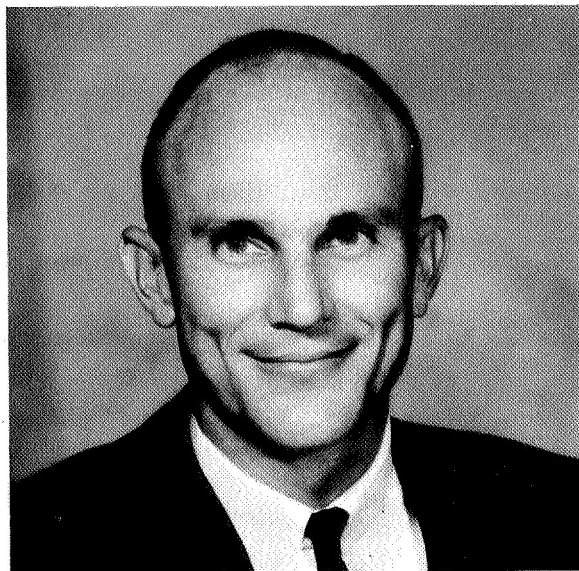
was born March 25, 1928, at Cleveland, Ohio. He received a bachelor of science degree from the U.S. Naval Academy in 1952.

Lovell received flight training following graduation from the Academy. He served in a number of assignments including a four-year tour as a test pilot at the Naval Air Test Center at Patuxent River, Maryland. He was program manager for the F4H weapon system evaluation. Lovell was graduated from the Aviation Safety School at the University of Southern California and served as flight instructor and safety officer with Fighter Squadron 101 at the Naval Air Station, Oceana, Virginia.

Lovell was one of the nine astronauts selected by NASA in September 1962. He was pilot of the Gemini VII mission, which was launched on December 4, 1965, and splashed down after 330 hours and 35 minutes. Lovell served as backup pilot for the Gemini IV mission, backup command pilot for Gemini IX and command pilot for the Gemini XII mission.

He has received the NASA Exceptional Service Medal for his space flight achievements; the 1966 Harmon International Trophy; and the 1966 American Astronautical Society Achievement Award.

Lovell is married to the former Marilyn Gerlach of Milwaukee, Wisconsin. They have four children: Barbara, born October 13, 1953; James, born February 15, 1955; Susan, born July 14, 1958; and Jeffrey, born January 14, 1966.



**THOMAS K. MATTINGLY II**

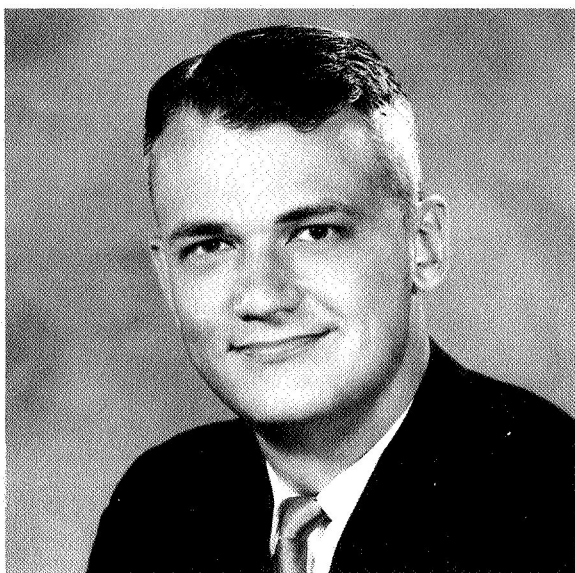
was born in Chicago, Illinois, March 17, 1936. He received a bachelor of science degree in aeronautical engineering from Auburn University in 1958.

He entered the United States Navy in 1958 and completed flight training in 1960. From 1960 to 1963 he was assigned to Attack Squadron 35 and flew A1H aircraft on carrier duty. In 1963 he served in A3B aircraft, also on carriers. His last assignment prior to his selection as an astronaut was as a student at the Air Force Aerospace Research Pilot School.

Mattingly was one of the 19 astronauts selected by NASA in April 1966.

Mattingly is not married.





## BRUCE McCANDLESS II

was born in Boston, Massachusetts, June 8, 1937. He received a bachelor of science degree from the U.S. Naval Academy in 1958; a master of science degree in electrical engineering from Stanford University in 1965; and is working toward a doctor of philosophy degree in electrical engineering at Stanford University.

He was graduated second in his class from the Naval Academy and received flight training at Pensacola, Florida, and Kingsville, Texas. In 1960 he received weapons system and carrier landing training at Key West, Florida. From 1960 to 1964 McCandless was assigned to Fighter Squadron 102 and participated in carrier duty, including the Cuban blockade. In early 1964 he was instrument flight instructor in Attack Squadron 43 at Naval Air Station Apollo Soucek Field, Oceana, Virginia. His last assignment before his selection as an astronaut was at Stanford University doing graduate studies in electrical engineering.

McCandless was one of the 19 astronauts selected by NASA in April 1966.

McCandless is married to the former Bernice Doyle of Rahway, New Jersey. They have two children: Bruce III, born August 15, 1961, and Tracy, born July 13, 1963.



## JAMES A. McDIVITT

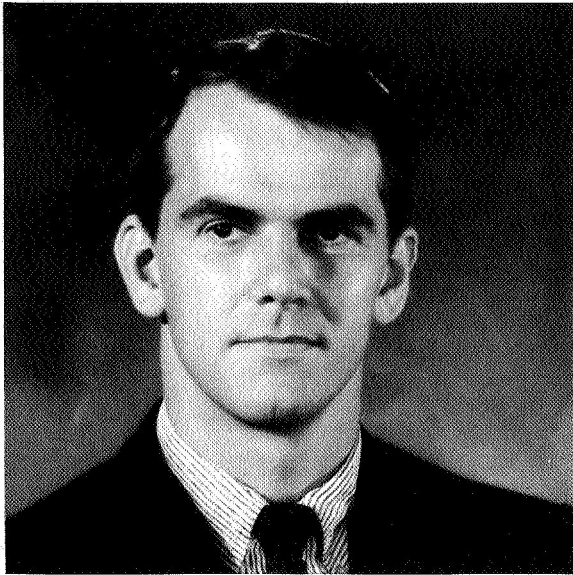
was born in Chicago, Illinois, June 10, 1929. He was graduated from the University of Michigan with a bachelor of science degree in aeronautical engineering in 1959, first in his class. He received an honorary doctor of philosophy degree in astronautical science from the University of Michigan in 1965.

He joined the Air Force in 1951 and, during the Korean War flew 145 combat missions. He is a graduate of the United States Air Force Experimental Test Pilot School and the United States Air Force Aerospace Research Pilot School. He served at Edwards Air Force Base, California, as an experimental test pilot.

McDivitt was one of the nine astronauts selected by NASA in September 1962. He was command pilot for the Gemini IV mission, which was a 66-orbit, four-day mission, launched from Cape Kennedy June 3, 1965.

He received the NASA Exceptional Service Award for his flight. Among other aeronautic and space-related awards, McDivitt has received the Arnold Air Society John Fitzgerald Kennedy Award for 1966.

He is married to the former Patricia A. Haas of Cleveland, Ohio. The McDivitts have four children: Michael, born April 14, 1957; Ann, born July 21, 1958; Patrick, born August 30, 1960; and Kathleen, born June 16, 1966.

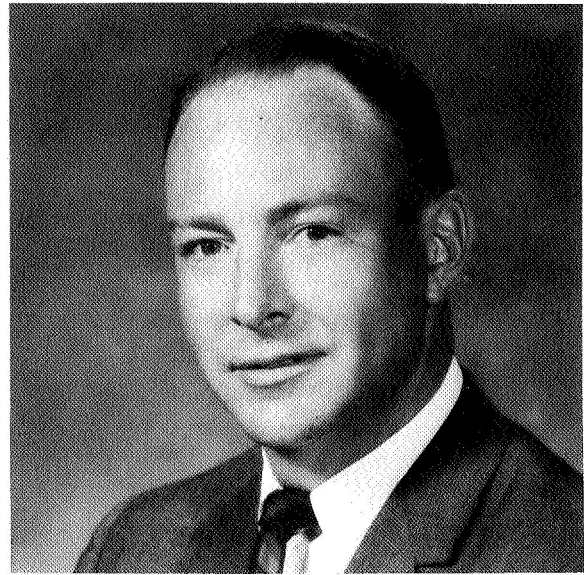


### F. CURTIS MICHEL

was born June 5, 1934, at LaCrosse, Wisconsin. He was graduated from the California Institute of Technology (CalTech), Pasadena, California, with a bachelor of science degree in physics in 1955 and received his doctorate in physics from CalTech in 1962.

Michel was a junior engineer working on the Corporal missile program at the Guided Missile Division of Firestone Tire and Rubber Company, Southgate, California, before joining the Air Force in 1955. An Air Force Reserve Officer Training Corps graduate, Michel received flight training at Marana Air Force Base, Tucson, Arizona, and at the Laredo and Perrin Air Force Bases, Texas. Michel taught at Rice University, Houston, Texas, from 1963 until joining NASA.

He is married to the former Beverly Muriel Kaminsky of Sacramento, California. The Michels have two children: Jeffrey, born August 19, 1963; and Alice, born July 30, 1966.



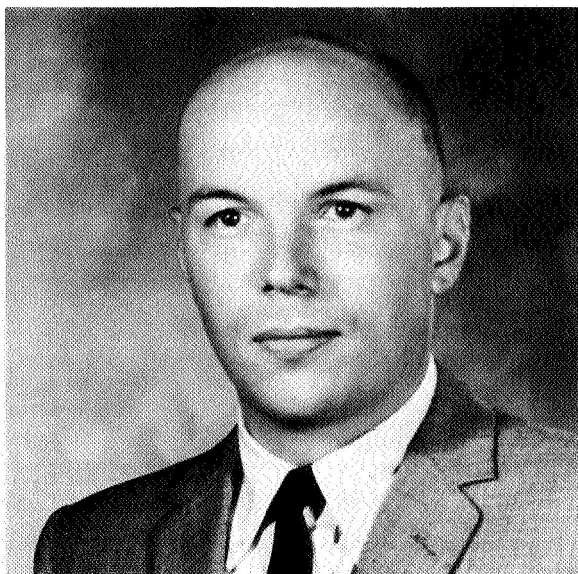
### EDGAR D. MITCHELL

was born in Hereford, Texas, September 17, 1930. He received a bachelor of science degree in industrial management from the Carnegie Institute of Technology in 1952, a bachelor of science degree in aeronautical engineering from the U.S. Naval Postgraduate School in 1961, and a doctor of science degree in aeronautics/astronautics from the Massachusetts Institute of Technology in 1964.

Mitchell entered the Navy in 1952, was commissioned in 1953, completed flight training in 1954 and was assigned to Patrol Squadron 29 in Okinawa. In 1957 and 1958 he flew A3 aircraft as part of Heavy Attack Squadron 2 on carrier duty. He was a research project officer with Air Development Squadron 5 in 1958 and 1959. After receiving his doctorate in 1964, he was assigned as Chief, Project Management Division, at the Navy Field Office for Manned Orbiting Laboratory. Prior to his selection as an astronaut, he graduated first in his class at the Air Force Aerospace Research Pilot School.

Mitchell was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Louise Elizabeth Randall of Muskegon, Michigan. The Mitchells have two daughters: Karlyn, born August 12, 1953; and Elizabeth, born March 24, 1959.




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### F. STORY MUSGRAVE

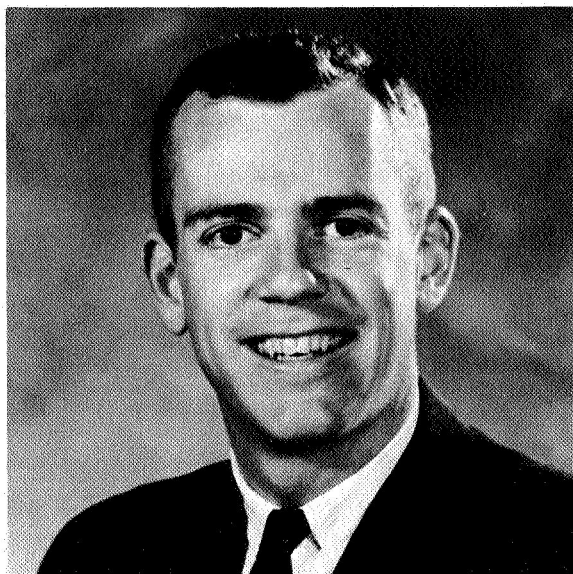
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was born August 19, 1935, in Boston, Massachusetts. Musgrave has earned seven college degrees. They are: A bachelor of science degree in statistics from Syracuse University in 1958; a masters degree in business administration in operations analysis from UCLA in 1959; a bachelor of arts degree in chemistry from Marietta College in 1960; an M.D. from Columbia University in 1964; a master of science degree in biophysics from the University of Kentucky in 1966; and a doctorate in physiology from the University of Kentucky in 1967.

Musgrave was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, Musgrave was a post-doctoral fellow at the University of Kentucky.

He is married to the former Marguerite Patricia Van Kirk of Wayne, New Jersey. They have four children; Lorelie Lisa, born in 1961; Bradley Scott, born in 1962; Holly Kay, born in 1963; and Christopher Todd, born in 1965.




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### BRIAN T. O'LEARY

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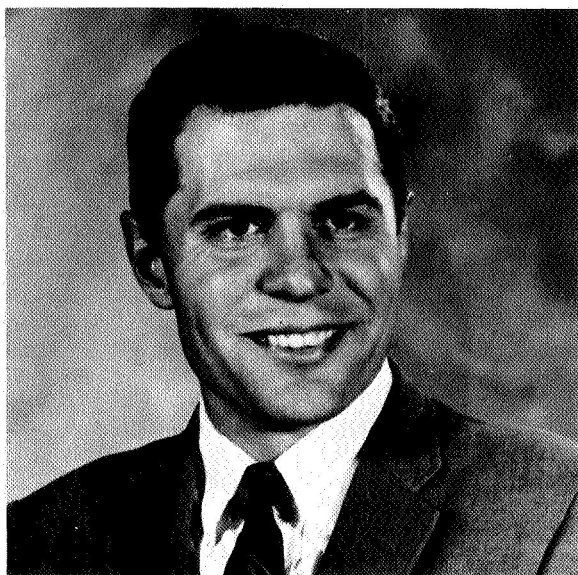
was born January 27, 1940, in Boston, Massachusetts. He received a bachelor of arts degree in physics from Williams College in 1961, and a master of arts degree in astronomy from Georgetown University in 1964. He received his doctorate in astronomy from the University of California, Berkeley, in 1967.

O'Leary was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, O'Leary was a NASA pre-doctoral trainee in the Space Sciences Laboratory, Department of Astronomy, at the University of California.

He is married to the former Joyce Whitehead of Kennett Square, Pennsylvania. They have no children.





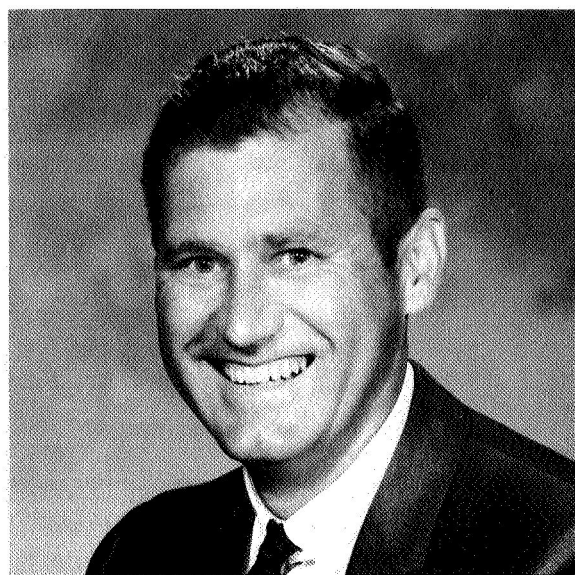
### ROBERT A. PARKER

was born December 14, 1936, in New York City, New York. He received a bachelor of arts degree in astronomy and physics from Amherst College in 1958, and a doctorate in astronomy from the California Institute of Technology in 1963.

Parker was one of eleven scientist-astronauts selected by NASA in August 1967.

Prior to his selection, Parker was an Assistant Professor of Astronomy at the University of Wisconsin.

He is married to the former Joan Audrey Capers of Waynesboro, Pennsylvania. They have two children: Kimberly, born in 1962; and Brian, born in 1964.



### WILLIAM R. POGUE

was born in Okemah, Oklahoma, January 23, 1930. He received a bachelor of science degree in education from Oklahoma Baptist University in 1951, and a master of science degree in mathematics from Oklahoma State University in 1960.

He entered the Air Force in 1951 and received his commission in 1952. He served with the Fifth Air Force in 1953 and 1954 and flew 43 combat missions over Korea. From 1955 to 1957 he was a member of the USAF Thunderbirds. Pogue has gained flying proficiency in over 50 types and models of American and British aircraft and is qualified as a civilian flight instructor. From 1960 to 1963, he served as mathematics instructor at the USAF Academy in Colorado Springs, Colorado. He is a graduate of the Empire Test Pilots' School in Farnborough, England, and in 1965 he completed a two-year tour as test pilot with the British Ministry of Aviation under the USAF/RAF Exchange Program. Prior to his selection as an astronaut, he was an instructor at the Air Force Aerospace Research Pilot School, Edwards Air Force Base, California.

Pogue was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Helen J. Dittmar of Shawnee, Oklahoma. The Pagues have three children: William, born September 5, 1953; Layna, born June 9, 1955; and Thomas, born September 12, 1957.



### STUART A. ROOSA

was born in Durango, Colorado, August 16, 1933. He received a bachelor of science degree in aeronautical engineering from the University of Colorado in 1960.

Roosa entered the United States Air Force in 1953, and was commissioned in the Air Force after graduation from the Aviation Cadet Program at Williams Air Force Base, Arizona. He flew F-84F and F-100 aircraft during a tour of duty at Langley Air Force Base, Virginia. After graduation from the University of Colorado under the Air Force Institute of Technology Program, he was chief of Service Engineering at Tachikawa Air Base, Japan, for two years.

From 1962 to 1964, Roosa was a maintenance test pilot at Olmsted Air Force Base, Pennsylvania. He graduated from the Air Force Aerospace Research Pilot School in 1965, and was assigned as an experimental test pilot at Edwards Air Force Base, California, prior to his selection as an astronaut.

Roosa was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Joan C. Barrett of Tupelo, Mississippi. The Roosas have four children: Christopher, born June 29, 1959; John, born January 2, 1961; Stuart Jr., born March 12, 1962; and Rosemary, born July 23, 1963.



### WALTER M. SCHIRRA, JR.

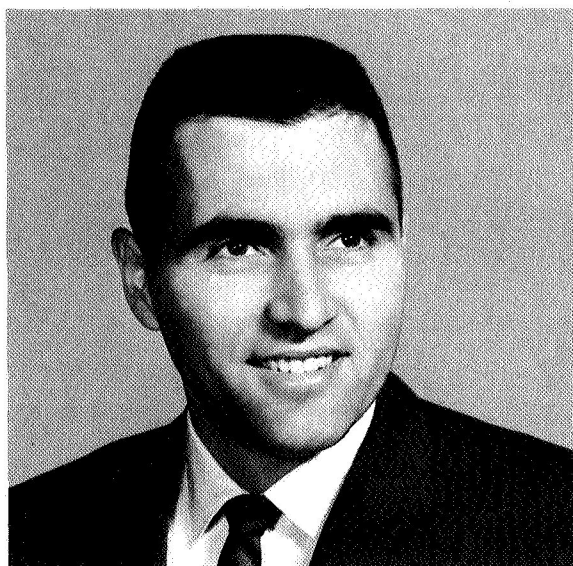
was born in Hackensack, New Jersey, March 12, 1923. He received a bachelor of science degree from the U.S. Naval Academy in 1945 and an honorary doctorate in astronautical engineering from Lafayette College, Pennsylvania, in 1966.

He received flight training at Pensacola, Florida. During the Korean conflict, Schirra flew 90 combat missions. Other assignments include project pilot for the F7U3 Cutlass and instructor pilot for the Cutlass and FJ3 Fury; operations officer on a carrier in the Pacific; test pilot training; and suitability development work on the F4H.

Schirra was one of the seven astronauts selected by NASA in April 1959. He was pilot of the MA-8 six-orbit "textbook" flight on October 3, 1962, and command pilot of Gemini VI, December 15-16, 1965, which established a space "first" by performing rendezvous with Gemini VII.

He received the NASA Distinguished Service Medal twice and the Exceptional Service Medal once. Other awards include: American Rocket Society Astronautics Award, 1963; Collier Trophy, 1963; American Institute of Aeronautics and Astronautics Award, 1963; American Astronautical Society Flight Achievement Award, 1966; and the 1966 Harmon International Aviation Trophy.

Schirra is married to the former Josephine Fraser of Seattle, Washington. They have two children: Walter III, born June 23, 1950; and Suzanne, born September 29, 1957.



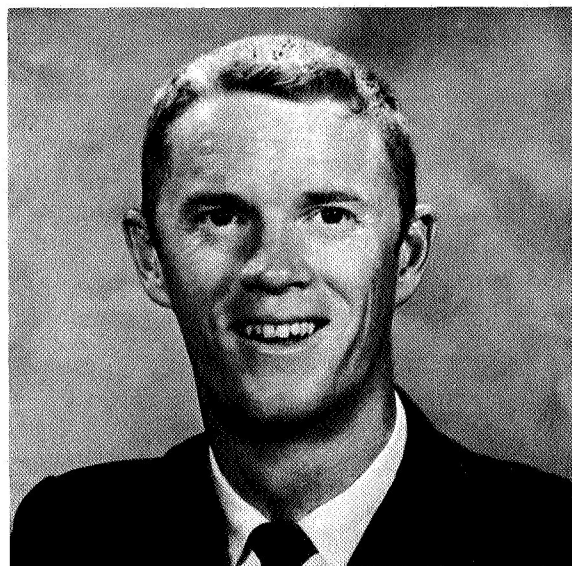
### HARRISON H. SCHMITT

was born in Santa Rita, New Mexico, July 3, 1935. He received his bachelor of science degree in geology from the California Institute of Technology in 1957. He attended the University of Oslo in Norway, 1957 and 1958, and received his doctorate in geology at Harvard University in 1964. Schmitt has been awarded a Fulbright Fellowship, 1957-58; a Kennecott Fellowship in Geology, 1958-59; a Harvard Fellowship, 1959-60; a Harvard Traveling Fellowship, 1960; a Parker Traveling Fellowship, 1961-62; and a National Science Foundation postdoctoral Fellowship, Department of Geological Sciences, Harvard University, 1963-64.

He has done geological work for the Norwegian Geological Survey in Oslo, and for the U.S. Geological Survey in New Mexico and Montana. Prior to his selection as an astronaut, Schmitt was with the U.S. Geological Survey's Astrogeology Department at Flagstaff, Arizona. He was project chief on photo and telescopic mapping of the moon and planets, and was among the USGS astrogeologists instructing NASA astronauts during their geological field trips.

Schmitt was one of the six scientist-astronauts selected by NASA in June 1965. He finished flight training in 1966.

Schmitt is not married.



### RUSSELL L. SCHWEICKART

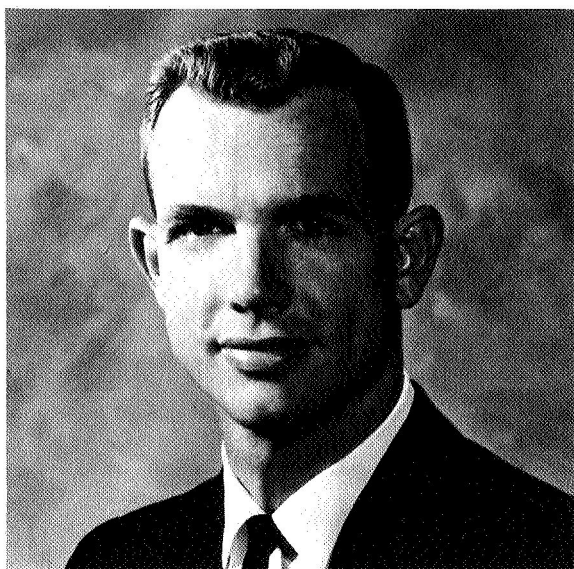
was born in Neptune, New Jersey, October 25, 1935. He received a bachelor of science degree in aeronautical engineering in 1956 and a master of science degree in aeronautics and astronautics in 1963 from Massachusetts Institute of Technology (MIT). His thesis was on stratospheric radiance.

He served as a pilot in the United States Air Force from 1956 to 1960. He was recalled to active duty for a year in 1961. Prior to his selection as an astronaut he was a research scientist at the Experimental Astronomy Laboratory at MIT. His duties there included research in upper atmospheric physics and applied astronomy, as well as research in star tracking and stabilization of stellar images.

Schweickart was one of the 14 astronauts selected by NASA in October 1963.

He is married to the former Clare G. Whitfield of Atlanta, Georgia. The Schweickarts have five children: Vicki, born September 12, 1959; Randolph and Russell, born September 8, 1960; Elin, born October 19, 1961; and Diana, born July 26, 1964.





### DAVID R. SCOTT

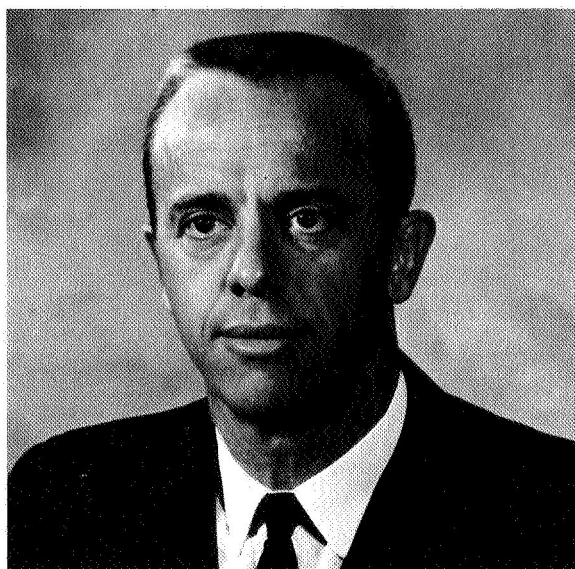
was born in San Antonio, Texas, June 6, 1932. He received a bachelor of science degree from the U.S. Military Academy in 1954, graduating fifth in a class of 633. From 1960 to 1962 he attended Massachusetts Institute of Technology (MIT) and earned both a master of science degree in aeronautics and astronautics and an engineer of aeronautics and astronautics degree. His thesis at MIT concerned interplanetary navigation.

As an Air Force officer, after his graduation from the Military Academy, he received flight training, attended the Air Force Experimental Test Pilot School, and the Air Force Aerospace Research Pilot School.

Scott was one of the 14 astronauts selected by NASA in October 1963. He was pilot of the Gemini VIII flight, March 16, 1966. This flight marked the first successful docking of a spacecraft with a target vehicle in space.

He has been awarded the NASA Exceptional Service Medal and the American Institute of Aeronautics and Astronautics Award in 1966.

Scott is married to the former Ann Lurton Ott of San Antonio, Texas. They have two children: Tracy, born March 25, 1961; and Douglas, born October 8, 1963.



### ALAN B. SHEPARD, JR.

was born in East Derry, New Hampshire, November 18, 1923. He received a bachelor of science degree from the U.S. Naval Academy in 1944.

Following destroyer service in the Pacific in World War II, he entered flight training and received his wings in 1947. Shepard's assignments in the Navy include U.S. Navy Test Pilot School at Patuxent River, Maryland, and flight test work there. He participated in experiments in development of the Navy's inflight refueling system; carrier trials for the F2H3; Navy trials of the first angled carrier deck; testing of the F3H, F8U, F4D, F11F; and project test pilot on the F5D. He was graduated from the Naval War College, Newport, Rhode Island, in 1958 and was assigned to the staff of the Commander in Chief, Atlantic Fleet, as air readiness officer.

Shepard was one of the seven astronauts selected by NASA in April 1959 and is now Chief, Astronaut Office. On May 5, 1961, he was this country's first man in space as pilot of the Mercury-Redstone 3, a suborbital flight. The flight attained an altitude of approximately 116 statute miles and the spacecraft traveled about 302 statute miles down the Eastern Test Range.

Shepard was awarded the NASA Distinguished Service Medal in 1961, and the Langley Medal in 1964.

He is married to the former Louise Brewer of Kennett Square, Pennsylvania. They have two children: Laura, born July 2, 1947; and Julie, born March 16, 1951.



**DONALD K. SLAYTON**

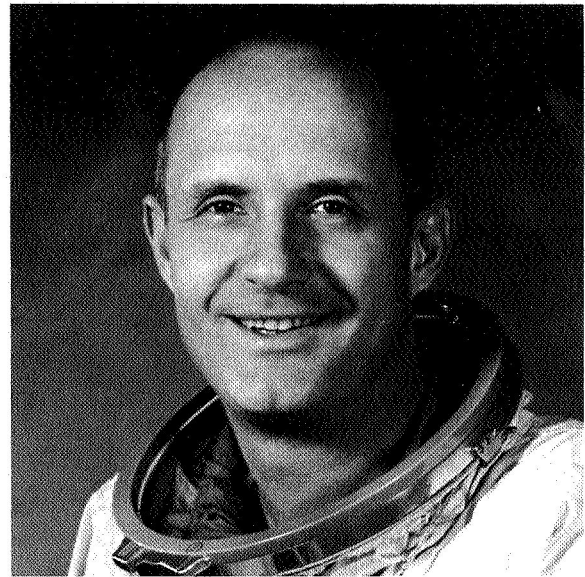
was born in Sparta, Wisconsin, March 1, 1924. He received a bachelor of science degree in aeronautical engineering from the University of Minnesota in 1949, and an honorary doctorate in engineering from Michigan Technological University in 1965.

He entered the United States Air Force in 1942 and became a pilot in 1943. During World War II he flew 56 combat missions in B-25s over Southern Europe and seven combat missions over Japan. From 1949 to 1951, he worked as an aeronautical engineer for the Boeing Company in Seattle, Washington, until being recalled to active duty and assignment to 12th Air Force Headquarters. In 1955, Slayton attended the Air Force Flight Test Pilot School at Edwards Air Force Base, California. From 1956 to 1959, he was an experimental test pilot at that base.

Slayton was one of the seven astronauts selected by NASA in April 1959. On November 29, 1961, he was named as the pilot of MA-7, the second manned orbital mission. On March 15, 1962, it was announced that a heart condition would prevent Slayton from making the flight. In November 1963, he resigned his commission as Air Force major, and continued with NASA Manned Spacecraft Center in the dual role of astronaut and Director, Flight Crew Operations, MSC.

Slayton was awarded the NASA Distinguished Service Medal in 1965.

He is married to the former Marjorie Lunney of Los Angeles, California. They have one son, Kent, born April 8, 1957.



**THOMAS P. STAFFORD**

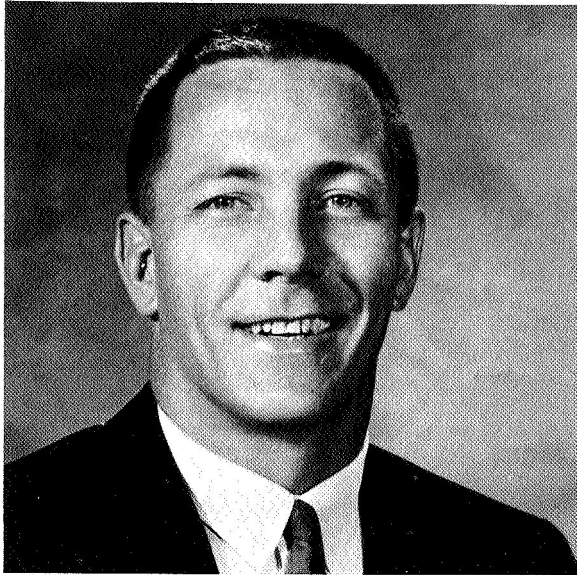
was born in Weatherford, Oklahoma, September 17, 1930. He received a bachelor of science degree from the U.S. Naval Academy in 1952.

He was commissioned in the Air Force and completed flight training and advanced interceptor training. He served five years as a fighter-interceptor pilot and subsequently was graduated from the Air Force Experimental Flight Test School in 1959. He is coauthor of *Pilot's Handbook for Performance Flight Testing* and *Aerodynamics Handbook for Performance Flight Testing*.

Stafford was one of the nine astronauts selected by NASA in September 1962. On December 15-16, 1965, with Astronaut Walter M. Schirra, Jr., as command pilot, he was pilot of the Gemini VI flight, which established a space "first" by achieving rendezvous with the orbiting Gemini VII. Stafford was command pilot of the Gemini IX mission on June 3, 1966, during which pilot Eugene A. Cernan spent two hours and 7 minutes in extravehicular activity, and multiple rendezvous was achieved using three different techniques.

Stafford has twice been awarded the NASA Exceptional Service Medal and received the American Astronautical Society Flight Achievement Award in 1966. He was also awarded the 1966 Harmon International Aviation Trophy.

He is married to the former Faye L. Shoemaker of Weatherford, Oklahoma. They have two children: Dionne, born July 2, 1954; and Karin born August 28, 1957.



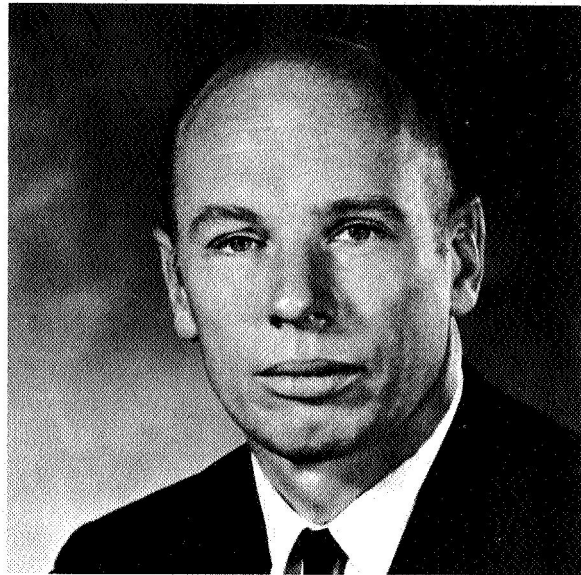
### JOHN L. SWIGERT

was born in Denver, Colorado, August 30, 1931. He received a bachelor of science degree in mechanical engineering from the University of Colorado in 1953 and a master of science degree in aerospace science from the Rensselaer Polytechnic Institute in 1965, and a master of science degree in business administration from the University of Hartford in 1967.

He served with the United States Air Force from 1953 to 1956. After completing flight training, Swigert was assigned as a fighter pilot in Japan and Korea.

Swigert was one of the 19 astronauts selected by NASA in April 1966. Prior to his selection, he was an engineering test pilot for North American Aviation, Inc., from 1964 to 1966. Swigert was corecipient of the AIAA Octave Chanute Award for 1966 for his participation in demonstrating the Rogallo Wing as a feasible land landing system for returning space vehicles and astronauts. From 1957 to 1964 he was a research engineering test pilot for Pratt and Whitney Aircraft.

Swigert is not married.



### WILLIAM E. THORNTON

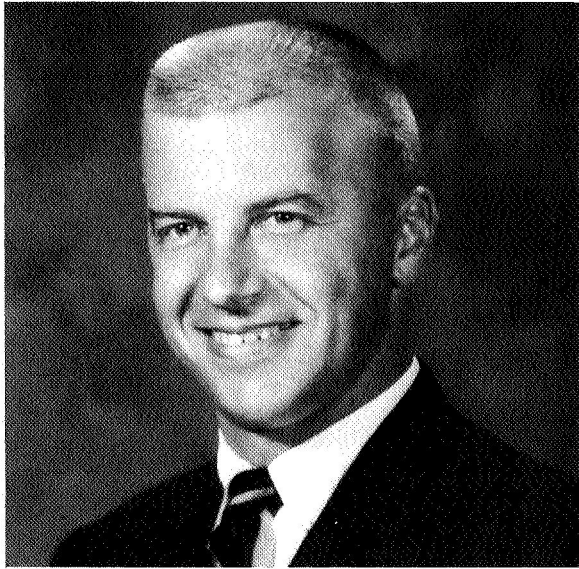
was born April 14, 1929, in Goldsboro, North Carolina. He received a bachelor of science degree in physics from the University of North Carolina in 1952, and an M.D. degree from the University of North Carolina in 1963.

Thornton was the Director of the Electronics Division, Del Mar Engineering Labs, Los Angeles, from 1956 to 1962. He was an instructor at the University of North Carolina Medical School in 1963 and 1964. In 1964 and 1965 Thornton was an intern at Wilford Hall USAF Hospital, Lackland Air Force Base, San Antonio, Texas. From 1965 to 1967 Thornton was associated with the Aerospace Medical Division, Brooks Air Force Base, San Antonio, Texas.

Thornton was one of eleven scientist-astronauts selected by NASA in August 1967.

He is married to the former Elizabeth Jennifer Fowler from Great Britain. They have two children: William Simon, born in 1959; and James, born in 1961.





### PAUL J. WEITZ

was born in Erie, Pennsylvania, July 25, 1932. He received a bachelor of science degree in aeronautical engineering from Pennsylvania State University in 1954 and a master of science degree from the U.S. Naval Postgraduate School in 1964.

He received his Navy commission through the Reserve Officer Training Corps at Pennsylvania State University and was assigned to destroyer duty in 1954. He completed flight training in 1956. From 1956 to 1960 he was assigned to the Naval Air Station in Jacksonville, Florida, as tactics instructor. From 1960 to 1962 Weitz served as project officer for various air-to-ground delivery tactics projects at China Lake, California. Prior to his selection as an astronaut, he was a detachment officer-in-charge at the Naval Air Station at Whidbey, Washington.

Weitz was one of the 19 astronauts selected by NASA in April 1966.

Weitz is married to the former Suzanne M. Berry of Erie, Pennsylvania. They have two children: Mathew, born September 23, 1958; and Cynthia, born September 25, 1961.



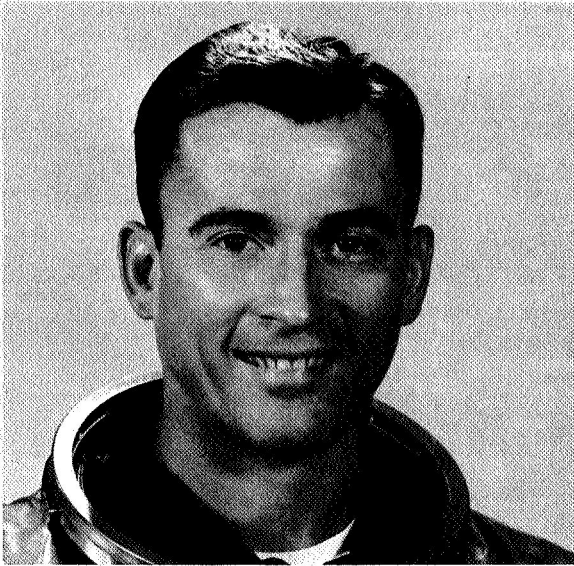
### ALFRED M. WORDEN

was born in Jackson, Michigan, February 7, 1932. He received a bachelor of science degree from the U.S. Military Academy in 1955 and master of science degree in astronautical/aeronautical engineering and instrumentation engineering from the University of Michigan in 1963.

He was commissioned in the Air Force after graduation from the Military Academy and completed flight training in Texas and Florida. From 1957 to 1961 he served as pilot and armament officer with the 95th Fighter Interceptor Squadron at Andrews Air Force Base, Maryland. He attended Instrument Pilots Instructor School at Randolph Air Force Base, Texas, in 1963. He was graduated from the Empire Test Pilots' School in Farnborough, England, in 1965, and from the Aerospace Research Pilots' School in 1965. When he was selected as an astronaut, he was assigned as an instructor at the Aerospace Research Pilot School.

Worden was one of the 19 astronauts selected by NASA in April 1966.

He is married to the former Pamela Ellen Vander Beek of Bayside, New York. The Wordens have two children: Merrill, born January 16, 1958, and Alison, born April 6, 1960.



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## JOHN W. YOUNG

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was born in San Francisco, California, September 24, 1930. He received a bachelor of science degree in aeronautical engineering from Georgia Institute of Technology in 1952.

Young entered the United States Navy in 1952. From 1959 to 1962 he served as a test pilot and program manager of the F4H weapons system project. In 1962 Young set world time-to-climb records in the 3000 meter and 25,000 meter altitudes in the F4B Navy fighter. He also served with Fighter Squadron 143 at Miramar, California.

He was one of the nine astronauts selected by NASA in September 1962. He was pilot of the first manned Gemini flight, Gemini III, on March 23, 1965, with Astronaut Virgil I. Grissom as command pilot. This was a three-orbit mission in which the flight crew performed the first orbital maneuver conducted by man. He was selected as backup pilot for the Gemini VI mission. Young was command pilot of the Gemini X mission. Among Gemini X's accomplishments were dual rendezvous with two Agena target vehicles, combined maneuvering of Gemini/Agena X, space flight to 475 miles above the earth, and three periods of extravehicular activity by the pilot.

Young was awarded the NASA Exceptional Service Medal in 1965 and in 1966.

He is married to the former Barbara V. White of Savannah, Georgia. The Youngs have two children: Sandy, born April 30, 1957; and John, born January 17, 1959.

## HIGHLIGHTS OF MANNED SPACE FLIGHTS

	Date	Flight Time (Hrs: Min: Sec:)	Revo- lutions	Spacecraft Name	Remarks
<i>Project Mercury</i>					
Alan B. Shepard, Jr.	5/5/61	00:15:22	Sub- orbital	Freedom 7	America's first manned space flight.
Virgil I. Grissom	7/21/61	00:15:37	Sub- orbital	Liberty Bell 7	Evaluated spacecraft functions.
John H. Glenn, Jr.	2/20/62	04:55:23	3	Friendship 7	America's first manned orbital space flight.
M. Scott Carpenter	5/24/62	04:56:05	3	Aurora 7	Initiated research experiments to further future space efforts.
Walter M. Schirra, Jr.	10/3/62	09:13:11	6	Sigma 7	Developed techniques and procedures applicable to extended time in space.
L. Gordon Cooper, Jr.	5/15-16/63	34:19:49	22	Faith 7	Met the final objective of the Mercury program—spending one day in space.
<i>Project Gemini</i>					
Virgil I. Grissom John W. Young	3/23/65	04:52:31	3	Gemini-III	America's first two-man space flight.
James A. McDivitt Edward H. White, II	6/3-7/65	97:56:12	62	Gemini-IV	First "walk in space" by an American astronaut. First extensive maneuver of spacecraft by pilot.
L. Gordon Cooper, Jr. Charles Conrad, Jr.	8/21-29/65	190:55:14	120	Gemini-V	Eight day flight proved man's capacity for sustained functioning in space environment.
Frank Borman James A. Lovell, Jr.	12/4-18/65	330:35:01	206	Gemini-VII	World's longest manned orbital flight.
Walter M. Schirra, Jr. Thomas P. Stafford	12/15-16/65	25:51:24	16	Gemini-VI-A	World's first successful space rendezvous.
Neil A. Armstrong David R. Scott	3/16-17/66	10:41:26	6.5	Gemini-VIII	First docking of two vehicles in space.
Thomas P. Stafford Eugene A. Cernan	6/3-6/66	72:20:50	45	Gemini-IX-A	Three rendezvous of a spacecraft and a target vehicle. Extravehicular exercise—2 hours 7 minutes.
John W. Young Michael Collins	7/18-21/66	70:46:39	43	Gemini-X	First use of target vehicle as source of propellant power after docking. New altitude record—475 miles.
Charles Conrad, Jr. Richard F. Gordon, Jr.	9/12-15/66	71:17:08	44	Gemini-XI	First rendezvous and docking in initial orbit. First multiple docking in space. First formation flight of two space vehicles joined by a tether. Highest manned orbit—apogee about 853 miles.
James A. Lovell, Jr. Edwin E. Aldrin, Jr.	11/11-15/66	94:34:31	59	Gemini-XII	Astronaut walked and worked outside of orbiting spacecraft for more than 5½ hours—a record proving that a properly equipped and prepared man can function effectively outside of his space vehicle. First photograph of a solar eclipse from space.






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## M. SCOTT CARPENTER

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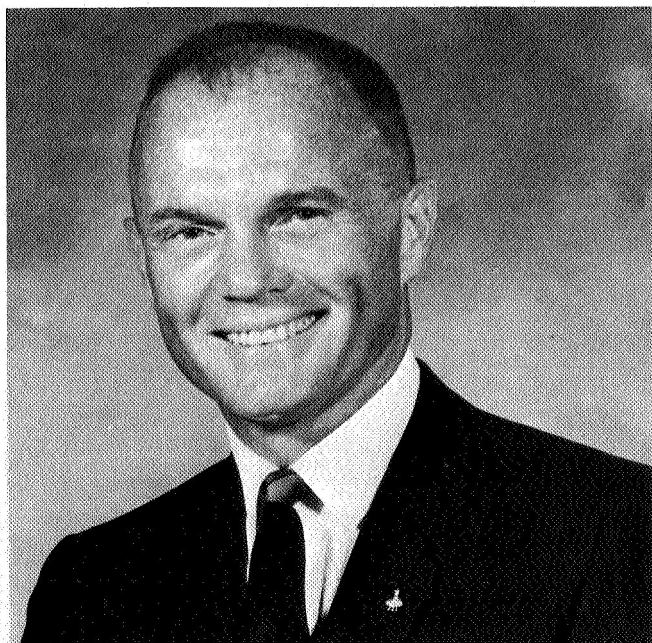
was born in Boulder, Colorado, May 1, 1925. After World War II he entered the University of Colorado and received a bachelor of science degree in aeronautical engineering.

Carpenter participated in the V-5 flight training program sponsored by the United States Navy at the University of Colorado in 1943.

Carpenter was one of the seven astronauts selected by NASA in April 1959. He served as backup pilot to John Glenn on the Mercury-Atlas 6 flight. Carpenter commanded the MA-7 three-orbit flight on May 24, 1962, and was awarded the NASA Distinguished Service Medal for his space voyage. Later he resigned from the astronaut program to return to the Navy and pursue his interest in deep sea exploration.

He is married to the former Rene Louise Price of Clinton, Iowa. The Carpenters have four children: Marc, born November 29, 1949; Robyn, born March 4, 1962; Kristen, born June 26, 1955; and Candace, born October 8, 1956.

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## JOHN H. GLENN

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was born July 18, 1921, in Cambridge, Ohio, and attended Muskingum College at Concord, Ohio. Entering the Naval Aviation Cadet Program in 1942, he was commissioned in the Marine Corps in 1943.

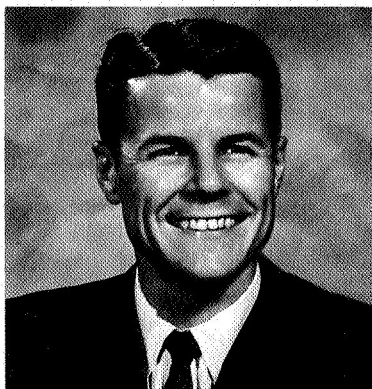
In April 1959 he was selected as an astronaut for Project Mercury. As pilot of "Friendship 7" spacecraft, Glenn was the first American to make an orbital flight. Launched from Cape Kennedy, Florida, the flight reached a maximum altitude of 162 miles and made 3 orbits in four hours, 55 minutes, 23 seconds, before landing in the Atlantic Ocean near Grand Turk Island.

Awarded the Distinguished Flying Cross five times, Glenn also holds the Air Medal with 18 clusters. He retired from the Astronaut Program in 1964, and became a consultant to NASA's Administrator in February 1965.

His wife is the former Anna Margaret Castor. They have two children, John David and Carolyn Ann.

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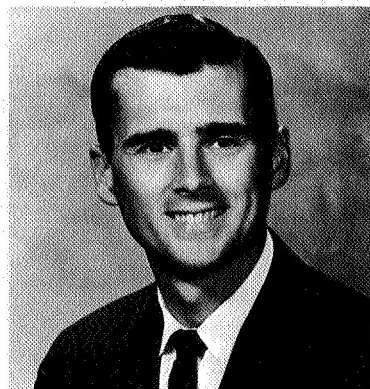


**CHARLES A. BASSETT II**

was named as an astronaut by NASA in October 1963.

A Major in the United States Air Force, he was born in Dayton, Ohio, December 30, 1931. Following graduate work in electrical engineering at the University of Southern California he entered the military service in October 1952.

Major Bassett lost his life in an aircraft accident during a routine flight to St. Louis, Missouri on February 28, 1966.

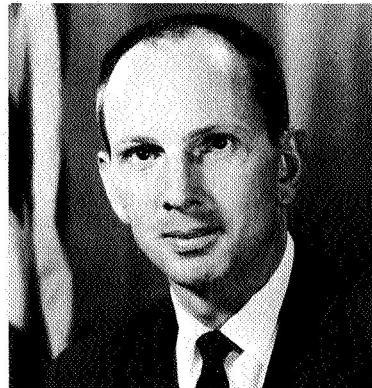


**ROGER B. CHAFFEE**

was named an astronaut by NASA in October 1963.

He was born in Grand Rapids, Michigan, February 15, 1935. He graduated from Purdue University with a bachelor of Science degree in Aeronautical Engineering in 1957. Joining the Navy later that year, he rose to the rank of Lieutenant Commander.

Commander Chaffee met death while participating in a simulated countdown of an Apollo spacecraft on January 27, 1967.

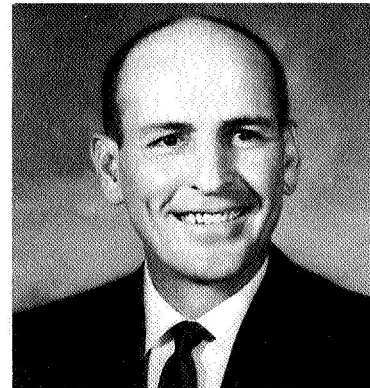


**THEODORE C. FREEMAN**

was named an astronaut by NASA in October 1963.

A Captain, United States Air Force, Freeman was born in Haverford, Pennsylvania, February 18, 1930. A graduate of the U.S. Naval Academy, Freeman received his Master of Science degree from Michigan University in 1960.

Captain Freeman died in an aircraft accident during a routine test flight at Ellington Air Force Base, October 31, 1964.



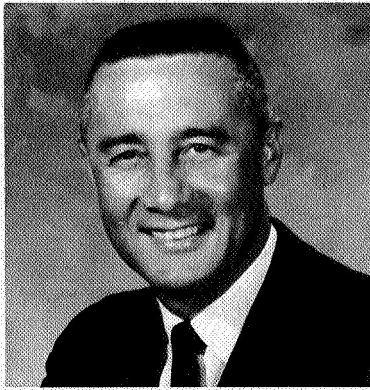
**EDWARD G. GIVENS, JR.**

was one of the 19 astronauts selected by NASA in April 1966.

Major Givens was born in Quanah, Texas, January 5, 1930. He received a bachelor of science degree from the U. S. Naval Academy in 1952.

Prior to his selection as an astronaut, he had been assigned to the Air Force's Space Systems Division Office at the Manned Spacecraft Center, Houston, Texas.

Major Givens lost his life in an off-duty automobile accident on June 6, 1967.

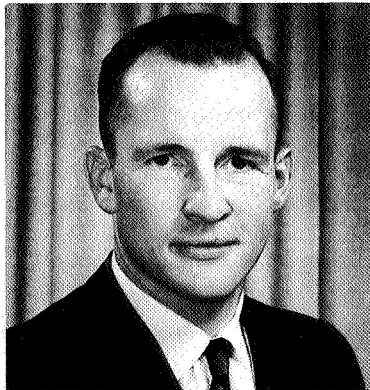


**VIRGIL I. GRISSOM**

was pilot of the Mercury-Redstone 4 (Liberty Bell 7) sub-orbital mission, July 21, 1961, which attained an altitude of 118 miles and traveled 302 miles in 15 minutes and 37 seconds. He was also commander of Gemini III, a three-orbit mission flown on March 23, 1965.

A Lieutenant Colonel in the U.S. Air Force, Grissom was born in Mitchell, Indiana, April 3, 1926, and named astronaut by NASA April 1959.

He met death during a simulated countdown of an Apollo spacecraft, January 27, 1967.



**EDWARD H. WHITE**

pilot for the four-day Gemini mission in June, 1965, was the first American to "walk" in space. He spent 21 minutes outside the spacecraft during the flight's third orbit.

Born in San Antonio, Texas, November 14, 1930, he was a graduate of the U.S. Military Academy, and became a Lieutenant Colonel in the U.S. Air Force. He was named as an astronaut by NASA in September 1962.

He met death while participating in a simulated countdown of an Apollo Spacecraft mission on January 27, 1967.



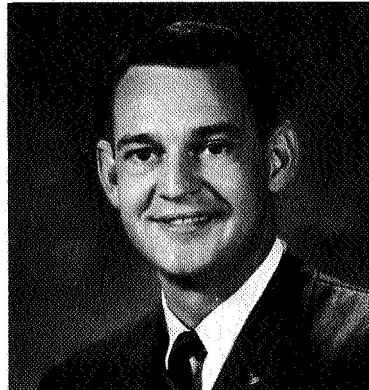
**ELLIOT M. SEE, JR.**

was named as an astronaut by NASA in September 1962.

Born in Dallas, Texas, July 23, 1927, he obtained his Master's degree in Engineering from the University of California in 1962.

Mr. See served three years in the Navy and was employed as a test pilot for ten years by the General Electric Company.

See lost his life in an aircraft accident during a routine flight to St. Louis, Missouri, on February 28, 1966.



**CLIFTON C. WILLIAMS, JR.**

was one of the 14 astronauts selected by NASA in October 1963.

He was born in Mobile, Alabama, September 26, 1932 and received his bachelor of science degree in mechanical engineering from Auburn University in 1954.

Williams was a graduate of the Navy Test Pilot School at Patuxent, Maryland. At the time of his selection as an astronaut, he was attending the Marine Corps Intermediate Staff and Command School at Quantico, Virginia.

Astronaut Williams lost his life in the crash of his T-38 jet trainer on October 6, 1967.

## APOLLO FLIGHT CREWS

*(as announced November 20, 1967)*

### FIRST MANNED FLIGHT (UPRATED SATURN I)

Prime Crew	Command Pilot, Walter M. Schirra, Jr. Senior Pilot, Donn F. Eisele Pilot, Walter Cunningham
Backup Crew	Command Pilot, Thomas P. Stafford Senior Pilot, John W. Young Pilot, Eugene A. Cernan
Astronaut Support Team	John L. Swigert, Jr. Ronald E. Evans William R. Pogue

### SECOND MANNED FLIGHT (SATURN V)

Prime Crew	Commander, James A. McDivitt Command Module Pilot, David R. Scott Lunar Module Pilot, Russell L. Schweickart
Backup Crew	Commander, Charles Conrad, Jr. CM Pilot, Richard F. Gordon LM Pilot, Alan L. Bean
Astronaut Support Team	Edgar D. Mitchell Fred W. Haise, Jr. Alfred M. Worden

### THIRD MANNED FLIGHT (SATURN V)

Prime Crew	Commander, Frank Borman CM Pilot, Michael Collins LM Pilot, William A. Anders
Backup Crew	Commander, Neil A. Armstrong CM Pilot, James A. Lovell LM Pilot, Edwin E. Aldrin
Astronaut Support Team	Thomas F. Mattingly II Gerald P. Carr John S. Bull